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Ameren UE

DOCKET NUMBER 50-483
CALLAWAY PLANT
UNION ELECTRIC COMPANY
PROPOSED REVISION TO TECHNICAL SPECIFICATIONS 3.9.4 "CONTAINMENT PENETRATIONS"; 3.3.6 "CONTAINMENT PURGE ISOLATION INSTRUMENTATION"; 3.3.7 "CREVS ACTUATION INSTRUMENTATION"; AND 3.3.8 "EMERGENCY EXHAUST SYSTEM ACTUATION INSTRUMENTATION"
TO ALLOW OPEN CONTAINMENT EQUIPMENT HATCH DURING REFUELING OPERATIONS

Reference: ULNRC-04574, December 6, 2001

Pursuant to 10 CFR 50.90, AmerenUE, in the above referenced submittal letter requested an amendment to the Facility Operating License No. NPF-30 for Callaway Plant. Several e-mails were transmitted and tele-conferences held between AmerenUE and NRC Staff to discuss the proposed license amendment request. In response to the additional requests for information from the NRC Staff, AmerenUE is revising the original submittal to incorporate the attached revised changes into the Callaway Plant Technical Specifications. This submittal application completely supercedes the referenced ULNRC-04574.

The current amendment application would revise Technical Specifications (TS) 3.9.4, "Containment Penetrations," to allow the containment equipment hatch and the emergency airlock to be open during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies within containment under administrative controls.

TS 3.3.6, "Containment Purge Isolation Instrumentation" is revised to bypass the requirement for an automatic actuation of containment purge isolation (CPIS) during CORE ALTERATIONS and/or during movement of irradiated fuel within

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containment. As designed, the purge system radiation monitor detectors GTRE0022 and GTRE0033 provide automatic CPIS actuation on high radiation in containment.As presently designed, in the event of a fuel handling accident (FHA), during CORE ALTERATIONS and/or during the movement of irradiated fuel assemblies in containment and with an open containment equipment hatch, the containment purge system would not isolate on an automatic CPIS and would remain in operation, ensuring negative pressure in containment. In this postulated plant condition and with the proposed changes, an operating Containment Purge and Exhaust System (includes shutdown purge or mini-purge systems) ensures that any radioactive release paths are directed and monitored via the Containment Purge and Exhaust System, until unisolated containment penetrations are closed.

TS 3.3.7, "Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation" is also revised to add a new surveillance requirement to response time test the control room radiation monitor detector channels. By design at Callaway Plant, bypassing the automatic CPIS actuation during CORE ALTERATIONS and/or during movement of irradiated fuel within containment also eliminates the automatic CRVIS actuation based on the purge system radiation monitor detectors. However, control room radiation monitor detectors, GKRE0004 and GKRE0005, provide the primary means to ensure that CRVIS actuation occurs on high radiation following a postulated fuel handling accident.

Finally, TS 3.3.8, “Emergency Exhaust System (EES) Actuation Instrumentation”, is changed to incorporate revised actions to be taken to limit control room doses if the EES instrumentation is inoperable, because the instrumentation is credited for limiting Control Room exposures in the event of a FHA in the fuel building.

The appropriate TS Bases changes for all proposed specification revisions are included for information and reflect the proposed changes.

Attachment 1 to this submittal provides the required Affidavit. Attachment 2 provides a detailed description, safety analysis of the proposed changes, and the Callaway determination that the proposed change does not involve a significant hazard consideration. Attachment 3 provides the existing TS pages marked-up to show the proposed change. Attachment 4 provides a clean copy of the proposed Technical Specification pages. Attachment 5 provides the existing TS Bases pages marked-up to show the proposed changes (for information only). Finally, Attachment 6 provides FSAR revisions to incorporate the proposed changes (for information only).

This letter identifies actions committed to by AmerenUE and Callaway Plant in this submittal. Other statements are provided for information purposes and are not considered to be commitments. A summary of the regulatory commitments included in this submittal is provided in Attachment 7. Attachment 8 provides the NRC questions and requests for additional information and the AmerenUE responses.

The Callaway Plant Review Committee and the Nuclear Safety Review Board have reviewed and approved this revised amendment application. It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. In addition, pursuant to 10 CFR 51.22(b), no environmental assessment need be prepared in connection with the issuance of this amendment.

AmerenUE requests approval of this proposed License Amendment by August 2002 prior to the next scheduled Refueling Outage 12. Receipt of this Amendment is not required to conduct the outage or to restart the unit following the outage. However, implementation of the requested TS change prior to the outage will allow critical planned outage work to proceed in conjunction with fuel handling activities. The approved amendment will be implemented prior to entry into MODE 6 during Refueling Outage 12.

AmerenUE is submitting this License Amendment Request in conjunction with the industry consortium of plants as a result of a mutual agreement known as Strategic Teaming and Resource Sharing or STARS. The STARS group consists of plants operated by TXU Electric, AmerenUE, Wolf Creek Nuclear Operating Corporation, Pacific Gas and Electric and STP Nuclear Operating Company. Members of the STARS group have already submitted plant specific License Amendment Requests similar to this request. The AmerenUE submittal has been coordinated with the other STARS submittals, however, takes a slightly different approach specific to Callaway Plant. The Callaway submittal is consistent with other STARS submittals in that the open containment equipment hatch provides outage flexibility without changing any dose consequences of design basis accidents. However, the method of managing and monitoring any potential release, in the event of a fuel handling accident, is specific to Callaway Plant.

Pursuant to 10 CFR 50.91(b)(1), AmerenUE is providing the State of Missouri with a copy of this proposed amendment.

If you should have any questions on the above or attached, please contact Dave Shafer at (314) 554-3104 or Dwyla Walker at (314) 554-2126.

Very truly yours,

JBlosser

John D. Blosser
Manager, Regulatory Affairs

DJW/mlo

Attachments:
1) Affidavit
2) Evaluation
3) Markup of Technical Specification pages
4) Retyped Technical Specification pages
5) Markup of Technical Specification Bases pages (for information only)
6) Markup of Callaway FSAR pages (for information only)
7) Summary of Regulatory Commitments
8) NRC Questions and AmerenUE Responses

STATE OF MISSOURI)
) SS
CITY OF ST. LOUIS)

John D. Blosser, of lawful age, being first duly sworn upon oath says that he is Manager Regulatory Affairs, for Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company 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 [signature]
John D. Blosser
Manager Regulatory Affairs

SUBSCRIBED and sworn to before me this 17th day of June, 2002.

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Notary Public - Notary Seal
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ULNRC-04674

ATTACHMENT 2

EVALUATION

EVALUATION

1.0 INTRODUCTION

This letter is a request to amend Operating License NPF-30 for Callaway Plant.

This amendment application would revise Technical Specifications (TS) 3.9.4, "Containment Penetrations," to allow the containment equipment hatch and the emergency airlock to be open during core alterations and/or during movement of irradiated fuel assemblies within containment under administrative controls.

In addition TS 3.3.6, "Containment Purge Isolation Instrumentation," would be revised to bypass a requirement for automatic actuation of containment purge isolation (CPIS) during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies within containment. Eliminating the automatic actuation allows the Containment Purge and Exhaust System (includes the containment shutdown purge and containment mini-purge systems) to remain in operation during refueling when the equipment hatch is open. In the event of a postulated design basis accident, while the containment equipment hatch and/or any other containment penetrations are unisolated, an operating Containment Purge and Exhaust System ensures that any potential radioactive release would be directed and monitored via the purge exhaust and not released directly to the environment. It also ensures negative pressure in containment is maintained. When the Containment Purge and Exhaust System remains in service, it ensures that Callaway meets General Design Criteria 64 (GDC 64) which requires monitoring the reactor containment atmosphere and plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences and postulated accidents. Manual capability for isolation of the Containment Purge and Exhaust System, if required, would remain unchanged.

TS 3.3.7, "CREVS Actuation Instrumentation," is revised to add a new surveillance to response time test the channels for the control room radiation monitor detectors. During CORE ALTERATIONS and/or movement of irradiated fuel assemblies within containment, and with an open containment equipment hatch, the control room radiation monitor detectors provide the primary means for control room ventilation isolation (CRVIS). The surveillance verifies that the control room radiation monitor detectors function within required time limits.

TS 3.3.7 LCO and APPLICABILITY are also revised to incorporate changes into Table 3.3.7-1. The revised Table 3.3.7-1 reflects separate instrumentation requirements for Function, Surveillance Requirements and Nominal Trip Setpoint to ensure CRVIS actuation when moving irradiated fuel assemblies within the fuel building versus when moving irradiated fuel assemblies within containment.

Separate actuation instrumentation is credited for protecting the control room based on generating CRVIS depending on whether a postulated fuel handling accident occurs in the fuel building or within containment. In addition, TS 3.3.7 ACTION E is revised to include the CONDITION for Required Action and associated Completion Time not met during CORE ALTERATIONS.

Finally, TS 3.3.8 CONDITIONS A, B, and C are revised to incorporate Required Actions necessary to address limiting Control Room doses when the EES instrumentation is inoperable. This instrumentation is credited for limiting Control Room exposures in the event of a FHA in the Fuel Building. REQUIRED ACTIONS are modified so that actions are required to place the CREVS trains in the Control Room Ventilation Isolation Signal (CRVIS) mode. These actions are required in the event of a FHA in the Fuel Building, while the automatic CPIS (and associated automatic CRVIS) is bypassed in containment.

Appropriate TS Bases and FSAR changes are included to reflect the proposed changes.

The proposed changes will allow scheduling of outage activities to be accomplished when the reactor vessel is open and covered by water in accordance with either FSAR Section 16.9.4 or TS 3.9.7. FSAR 16.9.4 requires that at least 23 feet of water is maintained over the top of the irradiated fuel assemblies within the reactor pressure vessel while in MODE 6 and during movement of control rods within the reactor pressure vessel. TS 3.9.7 requires the refueling pool water level to be maintained ≥ 23 feet above the top of the reactor vessel flange during the movement of irradiated fuel assemblies within containment.

The proposed changes will permit flexibility for outage work to proceed in conjunction with critical path activities without a reduction in plant safety or safety to the general public.

2.0 DESCRIPTION OF PROPOSED AMENDMENT

The proposed change would revise Limiting Condition for Operation (LCO) 3.9.4 to allow the containment equipment hatch and the emergency airlock to be open during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies within containment, provided that they are capable of being closed. A new Surveillance Requirement (SR) would be added to verify the capability to install the containment equipment hatch, if the hatch is open, at a Frequency of seven days.

The TS Bases are revised to reflect the changes to LCO 3.9.4 and the addition of a new Surveillance Requirement. TS 3.9.4 currently includes a requirement (SR 3.9.4.2) for verifying that each required containment purge isolation valve actuates to the isolation position on an actual or simulated actuation signal. Because the automatic actuation requirement for containment purge isolation valves is bypassed, Surveillance Requirement 3.9.4.2 (renumbered to SR 3.9.4.3 after the addition of the new Surveillance) is modified to eliminate the requirement to verify an actual or simulated actuation signal. The revised requirement verifies a manual actuation signal. During CORE ALTERATIONS and/or during movement of irradiated assemblies within containment, containment purge isolation valves are OPERABLE if capable of being closed on a manual actuation signal. Finally, the Bases are revised to identify the administrative controls associated with the allowance to maintain the containment equipment hatch open.

Another proposed change to LCO 3.9.4 would allow the emergency air lock to remain open during refueling under administrative controls similar to the personnel air lock. During a refueling outage, other work inside containment continues during fuel movement and CORE ALTERATIONS. A large number of personnel are working in containment. An open emergency air lock adds flexibility to the scheduling of work, the movement of equipment and aids the more efficient and rapid evacuation of containment, if required. In addition, in the event that normal power is not available, the open emergency airlock provides a pathway for the cables associated with the diesel generator backup power supply that is needed to close the containment equipment hatch. Although it is very unlikely that loss of power would occur during a postulated fuel handling accident and although this scenario is beyond licensing basis, Callaway considers it prudent to provide a means for closure of the containment equipment hatch. Because under the proposed change, containment could be isolated and evacuated more quickly, the dose to workers, in the event of an accident, would be reduced while the potential dose to the public would remain acceptable.

The proposed change to TS 3.3.6 revises the Limiting Condition for Operation (LCO) 3.3.6 (Table 3.3.6-1) to eliminate a requirement for automatic CPIS actuation based on detection of high radiation in containment by the containment purge exhaust radiation-gaseous monitors, GTRE0022 and GTRE0033. This change would be effective only during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies within containment. Elimination of the automatic CPIS provides assurance that the Containment Purge and Exhaust System will not isolate, but remain in service in the event of a postulated design basis fuel handling accident. In the event the containment equipment hatch is open, any release would be monitored via the Containment Purge and Exhaust System and containment would be maintained at negative pressure until the containment equipment hatch could be closed. Manual Containment Purge and Exhaust System isolation capability remains as a TS requirement to ensure isolation capability when required. The alarm and indication functions associated with the radiation monitors GTRE0022 and GTRE0033 remain available.

As a result of the change to the LCO and since the manual Containment Purge and Exhaust System isolation capability is retained, Condition C is modified to require action only if one or more manual channels are inoperable. The TS Bases are revised to reflect the changes to LCO 3.3.6 (Table 3.3.6-1) and Condition C.

A proposed change to the Limiting Condition for Operation (LCO) 3.3.7 (Table 3.3.7-1) incorporates a new surveillance requirement to assure CRVIS actuation on high radiation during CORE ALTERATIONS and/or during movement of irradiated fuel within containment. The new SR ensures that in the event of a design basis fuel handling accident in containment, the control room ventilation radiation monitor detectors, GKRE0004 and GKRE0005, detect high radiation and initiate CRVIS. The new SR requires response time testing on the control room ventilation radiation monitor instrument channels (a Note is added, however, that excludes response time testing of the monitor detectors themselves due to the nature of the detectors). In the event that a fuel handling accident occurs in the fuel building, the fuel building ventilation radiation monitor detectors, GGRE0027 and GGRE0028, detect high radiation and initiate CRVIS. Due to the remote location of these Fuel Building radiation monitors relative to the Control Room intake louvers, the FBVIS will isolate the Control Room prior to the post-accident radioactive plume reaching the Control Room intake louvers and the CRVIS function is not response time tested for these monitors. In support of the proposed amendment request, TS 3.3.7 CONDITION E is also revised to incorporate the Required Actions for the plant condition "during CORE ALTERATIONS".

The TS Bases are revised to reflect the changes to LCO 3.3.7, CONDITION E, and the addition of the new Surveillance Requirement during CORE ALTERATIONS and/or during movement of irradiated fuel within containment.

Finally, TS 3.3.8 CONDITIONS A, B, and C are revised to incorporate Required Actions and Completion Times necessary to address limiting Control Room doses when the EES instrumentation is inoperable. This instrumentation is credited for limiting Control Room exposures in the event of a FHA in the Fuel Building. REQUIRED ACTIONS are modified so that actions are required to place the CREVS trains in the Control Room Ventilation Isolation Signal (CRVIS) mode. These actions are required in the event of a FHA in the Fuel Building, while the automatic CPIS (and associated automatic CRVIS) is bypassed in containment.

The TS 3.3.8 Bases are revised to reflect the changes to CONDITIONS A, B, and C.

3.0 BACKGROUND

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. Technical Specification 3.9.4, "Containment Penetrations," requires that the equipment hatch be closed and held in place by four bolts during fuel movement and CORE ALTERATIONS. This requirement ensures that a release of fission products within the containment will be restricted from escaping to the environment.

As described in Section 3.8.2.1.1 of the Callaway Final Safety Analysis Report (FSAR), the containment equipment hatch is a welded steel assembly with a double-gasketed, flanged, and bolted cover. A moveable missile shield is provided on the outside of the reactor building to protect the containment equipment hatch. During shutdown conditions, administrative controls ensure that an appropriate missile barrier is in place during the threat of severe weather that could result in the generation of tornado driven missiles. The containment equipment hatch is raised and lowered with two dedicated hoists. Each hoist is electrically powered from the normal non-class 1E electrical distribution system. Both hoists are needed to close the containment equipment hatch.

Also described in Section 3.8.2.1.1 are the personnel and emergency air locks that form part of the containment pressure boundary and provide personnel access during all MODES of operation. The personnel air lock is nominally a right circular cylinder, approximately 10-ft in diameter, with a door at each end. The emergency air lock is approximately 5 ft 9 in inside diameter with a 2 ft 6 in door at each end. Callaway License Amendment 114 revised TS 3.9.4 and its associated Bases to allow the containment personnel airlock doors to be open during CORE ALTERATIONS and during movement of irradiated fuel assemblies within containment.

The current requirement for automatic Containment Purge and Exhaust System isolation during fuel handling operation results from the assumptions used to evaluate the consequences of a Reactor Building fuel handling accident (RBFHA). Originally, Technical Specifications required a modified Containment Integrity during fuel handling operations. However, when approval was received to handle fuel with the Personnel Airlock open, the Callaway Licensing Bases radiological consequences analyses for the RBFHA sequence was revised to take no credit for retention, holdup, or decay of radioactivity within the Reactor Building. However, the automatic Containment Purge and Exhaust System isolation function was retained so that the actual radioactivity releases would be reduced by isolating the Containment Purge and Exhaust System following a RBFHA.

Implementation of the proposed Technical Specification change now creates a direct opening between the Reactor Building atmosphere and the outside environment. GDC 64 requires that post-accident releases be monitored. Continued service of the Containment Purge and Exhaust System during the time interval between the RBFHA and closure of the containment equipment hatch, the emergency airlock, and the personnel airlock will maintain the Reactor Building at a negative pressure relative to the outside environment, and will ensure that post-accident releases are monitored as they are released via the Unit Vent.

The proposed license amendment request deletes only the automatic CPIS actuation on high purge exhaust radiation during core alterations or fuel movement inside containment. This ensures a controlled and monitored release (in the event of a postulated FHA inside containment), through the Containment Purge and Exhaust System rather than out the open containment equipment hatch. The proposed change ensures service, i.e., prevent isolation, of the Containment Purge and Exhaust System during refueling activities. Without deleting the automatic CPIS actuation, and assuming a postulated FHA inside containment, the Containment Purge and Exhaust System would isolate on high purge exhaust radiation prior to closing the containment equipment hatch. This would potentially allow an uncontrolled and unmonitored release via the open containment equipment hatch.

Based on the Callaway design, deleting the automatic CPIS actuation on high purge exhaust radiation also removes the automatic CREVS actuation from CPIS on that signal. Removing the automatic CREVS actuation on a CPIS has already been accounted for in the control room dose calculations that credit automatic CREVS actuation on high control room air intake radiation (GKRE0004, GKRE0005 channels). Automatic protection of Control Room personnel will continue to be provided by GKRE0004 and GKRE0005.

Although deleting the automatic CPIS actuation on high purge exhaust radiation also removes the associated automatic CREVS actuation, the change does not impact the actuation of CREVS within the fuel building. Fuel building exhaust radiation channels (GGRE0027 and GGRE0028) continue to be credited for providing automatic CREVS actuation should a postulated FHA occur inside the fuel building. Function 5, "Fuel Building Exhaust Radiation-Gaseous" is added to Table 3.3.7-1 to distinguish the instrumentation requirements for the postulated FHA inside the fuel building from the requirements for the postulated FHA inside containment. There is no effect on the fuel building FHA analysis and the dose consequences to the control room remain unchanged.

Operation of the Containment Purge and Exhaust System following a RBFHA will not result in any increase in the Licensing Bases radiological consequences for a RBFHA. Additionally, operation of the Containment Purge and Exhaust System will not result in an increase in plant effluents during normal plant operations.

4.0 REGULATORY REQUIREMENTS AND GUIDANCE

The regulatory basis for TS 3.9.4, "Containment Penetrations," is to ensure that the primary containment is capable of containing fission product radioactivity that may be released from the reactor core following a fuel handling accident inside containment. This ensures that offsite radiation exposures are maintained well within the requirements of 10 CFR 100.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 16, “Containment Design,” requires that reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as the postulated accident conditions require.

GDC 56, "Primary Containment Isolation," describes the isolation provisions that must be provided for lines that connect directly to the containment atmosphere and which penetrate primary reactor containment unless it can be demonstrated that the isolation provisions for a specific class of lines are acceptable on some other defined basis.

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 assure 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.

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

NUREG/CR-5009, “Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors,” relates to the expected release fraction for the radioactive iodine. According to this report, the calculated release fraction for extended burnup fuel may be up to 20% higher than that assumed in Regulatory Guide 1.25 for iodine-131.

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 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 fuel handling accident and GDC 61 with respect to appropriate containment, confinement, and filtering systems.

5.0 TECHNICAL ANALYSIS

The proposed changes would allow the containment equipment hatch to be open under administrative controls during core alterations and/or during movement of irradiated fuel assemblies within containment, provided that it is capable of being closed. In addition the proposed changes would allow the emergency air lock to remain open during refueling activities under administrative controls similar to the personnel air lock. To support this plant scenario, elimination of automatic CPIS actuation during refueling, when the equipment hatch is open, ensures the Containment Purge and Exhaust System is in service to maintain negative pressure in containment and to monitor any potential release via the purge exhaust system until the equipment hatch can be closed. Finally, to ensure the protection of control room by actuation of CRVIS, a new Surveillance Requirement is added to verify that the control room radiation monitor channels function within required time limits.

Allowing the containment equipment hatch to be open during CORE ALTERATIONS or movement of irradiated fuel raises the concern that radioactive materials could potentially be released through the open hatch and vented to the outside environment should accidents that involve fission product releases occur. Postulated accidents that could result in a release of radioactive material through the open hatch include a fuel handling accident that results in breaching of the fuel rod cladding, and a loss of residual heat removal (RHR) cooling event that leads to core boiling and uncovery. To provide the basis for justifying the proposed change, the concern with the potential radiological consequences of the two accidents that could result in a release of radioactive material through the open equipment hatch are discussed below.

Fuel Handling Accident (FHA)

During movement of irradiated fuel assemblies within containment, the most severe radiological consequences are anticipated to result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel. Fuel handling accidents include dropping a single irradiated fuel assembly, or a handling tool or heavy object, onto other irradiated fuel assemblies.

The radiological consequences of a design basis fuel handling accident in containment have been previously evaluated assuming that the containment is open to the outside atmosphere. All airborne activity reaching the containment atmosphere is assumed to be exhausted to the environment within 2 hours of the accident.

Amendment No. 114 (Reference 10.1) approved leaving the containment air lock open during irradiated fuel movement and core alterations. In that application, AmerenUE recalculated the doses associated with a fuel handling accident. The analysis calculated the doses for the 0-2 hour period at the exclusion area boundary. The calculated doses were within the Standard Review Plan acceptance criteria of 6 REM to the whole body and 75 REM to the thyroid. As discussed in Amendment No. 114, the analysis assumes all radioactive material from the FHA is released to the environment within a two-hour period. This results in the same impact of potential dose consequences from a simultaneous release of gaseous effluents through an unisolated penetration flow path and the open personnel airlock doors (Reference 10.2). It also results in the same impact of potential dose consequences from a simultaneous release of gaseous effluents through an open containment equipment hatch. Therefore, allowing an open containment equipment hatch during core alterations or movement of irradiated fuel will not invalidate the conclusion that the potential dose consequences from a FHA will be well within the 10 CFR Part 100 limits.

In addition to the impact on offsite radiological consequences, the radiological consequences to the Control Room operator provided in support of Amendment No. 114 remain bounding. The radiological consequences to the Control Room operator continue to be bounded by the values reported in support of Amendment no.114. This conclusion is based on analyses that delays Control Room isolation to account for the new response times specified in the revised Technical Specification 3.3.7. The calculated offsite and control room operator doses are within the acceptance criteria of Standard Review Plan 15.7.4 (Reference 10.5) and General Design Criteria (GDC) 19.

On the basis of these evaluations, various revisions to Technical Specification Section 3.9.4, "Containment Penetrations" have been accepted by the NRC (References 10.1 and 10.2).

During refueling operations, the potential for containment pressurization as a result of a fuel handling accident is not likely. Therefore, the majority of the radioactive material releases from the accident would be held up inside containment with only a minimal amount of radioactive material released through the open containment equipment hatch. However, the combined dose consequences of this potential release with the releases through other unisolated penetration flow paths and the open airlock doors, will be bounded by the current licensing basis fuel handling accident analysis. The current design basis fuel handling analysis does not credit the containment building barriers. It is assumed that all gap activity is released from the damaged rods and all the gaseous effluent escaping from the refueling pool is released directly to the environment within two hours through the open airlock doors.

According to Section 15.7.4 of the Callaway FSAR (Reference 10.3), the resulting offsite dose consequences with both personnel air lock doors open were calculated to be 73.0 rem thyroid and 0.334 rem whole body at the exclusion area boundary. These results are well within the 10 CFR 100 limits. Since the total amount of radioactive material available for immediate releases into the water during a postulated fuel handling accident will be the same, the potential dose consequences from a simultaneous release of the gaseous effluents through the unisolated penetration flow paths, the open airlock doors and the open containment equipment hatch will not be different from the previous analysis that assumes radioactivity to be released only through the open airlock doors. Therefore, allowing the containment equipment hatch to be open during CORE ALTERATIONS or movement of irradiated fuel would not invalidate the conclusion that the potential dose consequences from a fuel handling accident will be well within the 10 CFR 100 guideline limits.

Loss of RHR Cooling

Release of radioactive materials are anticipated to be insignificant as a result of core boil-off due to a loss of RHR cooling, if the event does not continue for an extended period of time resulting in core uncovery and subsequent core damage. If core boil-off continues, the compartments in the vicinity of the core could be pressurized and thereby provide a driving force for the containment atmosphere to be released via the open hatch flow path to the outside atmosphere. However, the radiological consequences of this release of radioactive materials due to core boil-off, with no consideration for core uncovery and core damage, is expected to be significantly less than the radiological consequences arising from a postulated fuel handling accident because the total coolant activity (corresponding to a 1% fuel defect) is less than the total gap activities in the damaged rods at the earliest time fuel offloading may be commenced (100 hours after shutdown).

A review of calculations performed for the outage risk assessment revealed that the time to core boil would be greater than 5 hours should a loss of RHR cooling event occur at the beginning of fuel offloading, based on the normal water level maintained in the refueling pool (i.e., in accordance with either FSAR Section 16.9.4 or TS 3.9.7). Technical Specification 3.9.5 requires that corrective actions be taken immediately to restore the RHR cooling as soon as possible if RHR loop requirements are not met (by having one RHR loop operable and in operation). In addition, operators are required to close all containment penetrations providing direct access from the containment atmosphere to the outside environment within 4 hours. If an operator takes actions to restore the RHR cooling capability or uses an alternative method of core cooling within 5 hours time interval, the scenario involving core boiling and subsequent containment pressure pressurization would not be present. With all penetrations closed within the specified time period, the potential for the coolant to boil and subsequently release radioactive gas to the containment atmosphere, if the RHR cooling was not restored, would not be of concern.

Finally, CORE ALTERATIONS associated with activities other than those directly involving fuel movement have little likelihood of resulting in a fuel damage event involving an appreciable release of activity in containment. Additionally, a loss of RHR during these activities is considered unlikely given the short amount of time in this plant configuration and the consequences would be the same as described above.

Administrative Controls

NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (Reference 10.4), Section 11.3.6.5, provides the following guidance:

".... for plants which obtain license amendments to utilize shutdown safety administrative controls in lieu of Technical Specification requirements on primary or secondary containment operability and ventilation system operability during fuel handling or core alterations, the following guidelines should be included in the assessment of systems removed from service:

- During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from the fuel. Following shutdown, radioactivity in the RCS decays fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay, and to avoid unmonitored releases.

- A single normal or contingency method to promptly close primary or secondary containment penetrations should be developed. Such prompt methods need not completely block the penetration or be capable of resisting pressure. The purpose is to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored."

The proposed changes do not affect the overall capability or availability for affected ventilation systems or radiation monitor detectors. The Control Room Emergency Ventilation System remains required to be OPERABLE by TS 3.7.10, "Control Room Emergency Ventilation System (CREVS)" as well as the containment atmosphere radioactivity monitors (TS 3.3.6, "Containment Purge Isolation Instrumentation"). CPIS is changed from automatic actuation to manual actuation to provide assurance that any potential release is directed and monitored through the containment purge exhaust. CRVIS actuation remains automatic, however, in the event of a fuel handling accident in containment, the source of the signal is generated from the control room radiation monitor detectors rather than the containment purge system radiation monitor detectors. A new Surveillance Requirement is added to verify their ability to function. In the event that a fuel handling accident occurs in the fuel building, the fuel building ventilation radiation monitor detectors, GGRE0027 and GGRE0028, detect high radiation and initiate CRVIS. The affected containment penetrations that provide direct access to the outside atmosphere are the emergency airlock and the containment equipment hatch. The emergency air lock is maintained open under similar conditions as the personnel air lock. Existing TS requirements on other penetrations that provide direct access are not affected.

Containment ventilation at Callaway is accomplished via the Containment Purge and Exhaust System which includes the Containment Shutdown Purge System and Containment Minipurge System. These systems are not credited in any of the dose analyses, so there are no associated TS OPERABILITY requirements for these systems. The Containment Shutdown Purge System operates to supply outside air into the containment for ventilation and cooling or heating needed for prolonged containment access following a shutdown and during refueling. The system may also be used to reduce the concentration of noble gases within containment prior to and during personnel access. The Containment Minipurge System may be used during power operations to reduce the concentration of noble gases within the containment prior to and during personnel access or to equalize internal and external pressures. Both systems share purge supply and exhaust containment penetrations. Each penetration is equipped with two valves in parallel inside containment and two valves in parallel outside containment.

Once cold shutdown is achieved, the Containment Shutdown Purge System is normally in operation. The system is manually initiated from the control room. The Containment Shutdown Purge System is designed to maintain the airborne radioactivity below the level required for personnel occupancy during refueling, and the Containment Minipurge System is designed to maintain airborne radioactivity below the required level for personnel occupancy during reactor power operation. The exhaust from either of these systems is ducted to the unit vent that is located at the top of the containment building. Either the containment shutdown or the mini-purge system assures air outside containment flows into the containment through the open containment equipment hatch and is exhausted through the monitored containment purge exhaust lines. The HEPA filter elements and charcoal adsorber sections are tested periodically in accordance with Regulatory Guide 1.140. The handswitches for the fan units and the handswitches for the purge valves are located in the control room. Therefore, in the event of a fuel handling accident inside containment with the containment equipment hatch open, the Containment Purge and Exhaust System can be easily controlled from the control room.

Exhaust from the containment is processed through the Containment Purge and Exhaust System charcoal adsorption train prior to discharge through the unit vent. The Containment Purge and Exhaust System is monitored for radioactivity, both upstream and downstream of the charcoal adsorber. The containment atmosphere radioactivity monitors (GTRE0031 and GTRE0032) continuously monitor the containment atmosphere for particulate, iodine, and gaseous radioactivity. The containment purge radiation monitors (GTRE0022 and GTRE0033) continuously monitor the containment purge exhaust duct during purge operations for particulate, iodine, and gaseous radioactivity. Normally these monitors would automatically isolate the Containment Purge and Exhaust System on high gaseous activity via the Engineered Safety Features Actuation System (ESFAS). However, the proposed revisions would eliminate this automatic function so that the purge system could remain in operation until the containment equipment hatch is closed. This would ensure negative pressure in containment and monitoring of a potential release. Although it is recognized that some exchange of air may occur at the open containment equipment hatch, the overall negative pressure in containment assures air flow through the Containment Purge and Exhaust System in compliance with GDC 64. In the event of a fuel handling accident inside containment, the control room alarm function of the required containment radiation monitors remains in service, and the radiation monitors provide indication of the magnitude of the release, thereby minimizing the potential for unmonitored release.

During CORE ALTERATIONS, Callaway FSAR Section 16.9.1.1 (Reference 10.5), requires that direct communications be maintained between the control room and personnel at the refueling station. Therefore, if a fuel handling accident were to occur inside containment, the control room would be immediately informed, and action would be promptly initiated in accordance with off-normal procedures to mitigate the consequences.

If open, the containment equipment hatch and the emergency air lock will be maintained in an isolable condition. The proposed revision to LCO 3.9.4 does not specifically include administrative control requirements for the emergency airlock and the containment equipment hatch. Unlike TS 3.6.3, Containment Isolation Valves, which include administrative controls in TS to ensure the status of multiple penetrations at higher MODES of operation, the administrative controls for the containment equipment hatch and the emergency airlock do not need to be specified in the TS. The TS and Bases provide the requirements for closure of the containment equipment hatch and the emergency air lock. Administrative controls consist of written procedures and will be established prior to the implementation of the proposed changes. These procedural controls would require the following and would also be applicable to the emergency air lock:

1. Appropriate personnel are aware of the open status of the containment during movement of irradiated fuel or CORE ALTERATIONS.

2. Specified individuals are designated and readily available to close the equipment hatch following an evacuation that would occur in the event of a fuel handling accident.

3. Any obstructions (e.g., cables and hoses) that would prevent rapid closure of an open equipment hatch can be quickly removed.

In addition new SR 3.9.4.2 ensures that the equipment necessary to close the hatch is at hand so that the hatch can be closed promptly in the event of a fuel handling accident inside containment. The equipment is dedicated for the purpose and the added surveillance precludes delays that would occur if the tools had to be rounded up. The same hardware, tools, equipment, and procedures are used to close the containment equipment hatch in all situations. As such there is no distinction between that which is required to close the hatch and that, which is required to close the hatch promptly. The added surveillance is sufficient for ensuring the necessary equipment is available and does not need to be duplicated as an administrative control.

When there is fuel in the reactor building and the containment equipment hatch is open, a designated individual will be present and available to direct closure of the containment equipment hatch. This is the same administrative control that is utilized to allow the personnel air lock to be open during CORE ALTERATIONS or movement of irradiated fuel assemblies (License Amendment No. 114). The same designated individual that is responsible for closing the air lock, following an evacuation that would occur in the event of a fuel handling accident, is also responsible for closing the containment equipment hatch. Direct and continuous communication with the control room is not necessary because the designated individual is readily available via other reliable communication systems. Training is provided to selected individuals responsible for various containment operations activities including personnel air lock, emergency air lock, and containment equipment hatch operation, as well as conditions that may require closure of these penetrations.

Given restated SR 3.9.4.2 to ensure dedicated tools and equipment and designated and trained individuals to close the equipment hatch (installed with four bolts), Callaway anticipates a typical closure time of less than one hour. This time frame is based on past experience and discussions with containment coordinators. It is also typical of other licensee experiences such as Vogtle, the precedent plant. This time is well within the minimum time of 4 hours (TS 3.9.5, Required Action A.4) for the core to boil with loss of RHR cooling at the beginning of fuel offload.

Note, the emergency air lock closure capability is similar to the personnel air lock closure capability in that it is provided by the availability of at least one door and the same designated individual to close it. The emergency air lock can be closed in less than 30 minutes following the containment equipment hatch being placed in the closed position.

<u>Closing the Containment Equipment Hatch, the Containment Equipment Hatch Missile Shield (Missile Shield), the Emergency Airlock, and the Personnel Airlock</u>

To support the accident analyses and evaluated dose consequences for the postulated fuel handling accident (FHA) inside containment and to isolate containment, closure of the containment equipment hatch is required. Closure is defined as the containment equipment hatch installed with four bolts. In the event of a postulated FHA inside containment, administrative controls ensure that the containment equipment hatch is closed. As stated above, the time to close the containment equipment hatch alone is expected to be less than an hour. In the absence of severe weather conditions, the missile shield may remain open.

Off-Normal plant procedures dictate the Control Room response to a Fuel Handling Accident. These procedures would direct the operators to manually initiate a Control Room Ventilation Isolation. The Containment Purge and Exhaust System would not be secured until the containment equipment hatch, the emergency airlock, and the personnel airlock are closed.

The following sequence of actions will be incorporated into Callaway's Off-Normal Operations procedures for the RBFHA sequence:

<u>If the Equipment Hatch is open</u>:

- Manually initiate CRVIS
- Close Containment Hatches in the following order:
  - Equipment Hatch
  - Emergency Airlock
  - Personnel Airlock
- Following closure of the Personnel Airlock, Manually Initiate CPIS

<u>If the Equipment Hatch is closed at the time of the RBFHA, the following actions will be taken</u>:

- Manually initiate CRVIS
- Close Containment Hatches in the following order:
  - Emergency Airlock
  - Personnel Airlock
- Following closure of the emergency airlock and personnel airlock, Manually Initiate CPIS

Continued service of the Containment Purge and Exhaust System during the time interval between the RBFHA and closure of the containment equipment hatch, the emergency airlock, and the personnel airlock will not result in any decrease or increase of calculated radiological consequences determined by the Licensing Bases radiological consequences analyses. It will ensure that all post-accident releases are monitored.

Closure of the containment equipment hatch is estimated to be completed within 1 hour. The best estimate mission dose calculated for closing the containment equipment hatch following a postulated fuel handling accident is 24.6 rem thyroid. This calculation is based on an hour exposure time for personnel to install the containment equipment hatch. Radiological exposure to each worker involved with closing the containment equipment hatch is calculated to be 24.6 rem to the thyroid.

Section 3.8.2.1.1 of the FSAR states that the containment equipment hatch missile shield is provided to protect the containment equipment hatch. Normally, under current requirements, the containment equipment hatch and the missile shield are closed during core alterations or during movement of irradiated fuel inside containment. However, under the proposed license amendment, when the containment equipment hatch is open under administrative controls, the missile shield is not required to be closed.

Statements in this submittal concerning the backup diesel generator and the administrative controls for installing the missile barrier in the event of severe weather are contingency actions for abnormal events. These contingencies are addressed in plant procedures. The plant procedures are written with the intent that the equipment hatch be installed upon the arrival of threatening weather conditions that could generate missiles. Under severe weather conditions, the equipment hatch door is installed and the missile shield is positioned to provide adequate protection.

When severe weather conditions are within the plant monitoring radius and for thunderstorms or tornadoes that are determined to be moving toward the plant, the containment equipment hatch missile shield is required to be closed for protection against weather generated missiles being propelled inside containment. Plant administrative controls require that the containment equipment hatch is installed (with four bolts) upon the arrival of threatening weather conditions that could generate missiles. The administrative controls also require that the missile shield is positioned to provide adequate protection. The containment equipment hatch is closed from inside containment and the missile shield is closed from outside of containment. Because the containment equipment hatch and the missile shield are not interlocked, closure sequence is not a factor. The equipment hatch door and the missile shield closing may be sequenced at the same time.

During refueling operations with the missile shield open, weather monitoring is required. The Callaway severe weather procedure is implemented on severe weather watch. The procedure requires that an assessment of current and future weather conditions (over a 48-hour period) is performed prior to removing the containment equipment hatch missile shield. This assessment includes a 140-mile monitoring radius around the plant.

The monitoring radius of 140 miles is based on a tornado translational speed of 70-mph (FSAR Site Addendum 2.3.1.2.6.2) and a time of 2 hours to close the missile shield. The two-hour closure time for the missile shield is the maximum time available from the time a tornado or thunderstorm is identified at the 140-mile perimeter. However, the best estimate for actual closure time is within one hour.

If the missile shield is open, and a thunderstorm or tornado is discovered at the perimeter, or within the monitoring distance, a determination is made as to whether the storm is moving toward the plant. If the thunderstorm or tornado is at the perimeter or within the monitoring distance and is moving toward the plant, then actions are taken to immediately close the missile shield.

If the thunderstorm or tornado is at the perimeter or within the monitoring distance, but is not moving toward the plant, then the missile shield may remain open as long as the weather monitoring continues to ensure the thunderstorm or tornado is not moving toward the plant.

When local severe weather conditions exist, weather monitoring is provided by activation of a dedicated weather radio, located in the Control Room, in the Shift Supervisor's office. The radio receives National Oceanic and Atmospheric Administration (NOAA, an organization of the U.S. Commerce Department) weather announcements. The NOAA keeps a round-the-clock vigil on atmospheric conditions and issues watches and warnings for severe atmospheric conditions. Additional provisions are also provided for immediate notification to the plant when monitored weather conditions change.

The weather monitoring and forecasting are provided on an hourly basis. Although weather-monitoring updates are supplied on an hourly basis, any severe weather that would enter the 140-mile monitoring radius would be immediately announced to the plant. At that point, if the storm is moving toward the plant, closure of the missile shield is initiated.

Callaway administrative controls are intended to be the same for the various containment openings. It is not necessary that the specific actions necessary for proper closure be contained in the TS Bases. Plant procedures address these items and changes to the procedures specifying the administrative controls fall within the 10 CFR 50.59 process. Making these administrative controls part of TS requirements or proposing a license condition would be inconsistent with what was approved in Amendment Nos. 115 and 93 for the Vogtle units and Amendment No. 114 for Callaway.

In conclusion, these administrative controls provide protection equivalent to that afforded by the administrative controls used to establish containment closure for a containment personnel air lock. An assessment of the radiological consequences, as described above for the proposed changes, concludes that site boundary doses remain well within the 10 CFR 100 limits and control room doses meet GDC 19 criteria without taking credit for closure of the equipment hatch. The administrative controls provide reasonable assurance that containment closure as a defense-in-depth measure can be reestablished quickly to limit releases much lower than assumed in the dose calculation.

Risk Significance

Based on the results of conservative dose calculations provided in this submittal, the risk to the health and safety of the public as a result of a fuel handling accident inside the containment with the equipment hatch open is minimal. Actual fuel handling accidents which have occurred in the past have resulted in minimal or no releases, which shows that the assumptions and methodology utilized in the radiological dose calculations are very conservative. Radioactive decay is a natural phenomenon. It has a reliability of 100 percent in reducing the radiological release from fuel bundles. In addition, the water level that covers the fuel bundles is another natural method that provides an adequate barrier to a significant radiological release. The requirement for at least 100 hours of decay prior to fuel movement is maintained in the Callaway FSAR Section 16.9.5 (Reference 10.6) and the requirement for water level is maintained in the TS. In addition, the requirements for isolable air locks, an isolable equipment hatch, isolable penetrations, and containment radiation monitors is maintained in the TS. The Containment Purge and Exhaust System will be in service in accordance with the aforementioned NUMARC 93-01 guidelines to further reduce radiological release. Therefore, the risk to the health and safety of the public as a result of allowing the equipment hatch to be open during fuel movement is minimal.

6.0 REGULATORY ANALYSIS

The method of analysis used for evaluating the potential radiological consequences of the postulated fuel handling accident is in compliance with Regulatory Guide 1.25 and the guidance in NUREG-0800, Section 15.7.4 and NUREG/CR-5009. The analysis presented in Section 15.7.4 of the Callaway FSAR, demonstrating the adequacy of the system design features and plant procedures provided for the mitigation of the radiological consequences of postulated fuel handling accidents, assumes no credit is taken for iodine removal by the atmosphere filtration system filters. All radioactivity released to the containment is assumed to be released to the environment at ground level over a two hour period.

The technical analysis performed by AmerenUE demonstrates that the consequent doses at the exclusion area and low population zone boundaries are well within the limits of 10 CFR 100. Therefore, the proposed License amendment is in compliance with GDC 16, 56, 61, and 64 as well as Regulatory Guide 1.25, NUREG/CR-5009, and the criteria contained in NUREG-0800, Section 15.7.4.

In conclusion, based on the considerations discussed above, 1) there is 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.

7.0 NO SIGNIFICANT HAZARDS DETERMINATION

AmerenUE has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92(c) as discussed below:

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

   Response: No

   The proposed changes will allow the containment equipment hatch to be open during CORE ALTERATIONS and movement of irradiated fuel assemblies inside containment. The status of the containment equipment hatch or the emergency air lock during refueling operations has no affect on the probability of the occurrence of any accident previously evaluated. The proposed revision does not alter any plant equipment or operating practices in such a manner that the probability of an accident is increased. Since the consequences of a fuel handling accident inside containment with an open containment equipment hatch are bounded by the current analysis described in the FSAR and the probability of an accident is not affected by the status of the containment equipment hatch, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   The proposed changes do not create any new failure modes for any system or component, nor do they adversely affect plant operation. No new equipment will be added and no new limiting single failures will be created. The plant will continue to be operated within the envelope of the existing safety analysis.

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

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

   Response: No

   The previously determined radiological dose consequences for a fuel handling accident inside containment with the air lock doors open remain bounding for the proposed changes. These previously determined dose consequences were determined to be well within the limits of 10 CFR 100 and they meet the acceptance criteria of SRP section 15.7.4 and GDC 19.

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

   Based on the above evaluations, AmerenUE concludes that the activities associated with the above described changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92 and accordingly, a finding by the NRC of no significant hazards consideration is justified.

8.0 ENVIRONMENTAL CONSIDERATION

AmerenUE has determined that the proposed amendment would 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. AmerenUE 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 analysis demonstrates that the consequences from a fuel handling accident inside containment are well within the 10 CFR 100 limits. The implementation of administrative controls precludes a significant increase in occupational radiation exposure. 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.

9.0 PRECEDENTS

There are precedents for allowing the equipment hatch to be open during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies within containment. The Southern Nuclear Operating Company operating licenses for the Vogtle Generating Electric Plant Unit 1 and 2, have been amended to allow the equipment hatch to be open during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies within containment. These amendments, Nos. 115 and 93, were issued on September 11, 2000. In addition, TXU Energy's operating license for Comanche Peak was amended with license amendment No. 93 in March of 2002.

10.0 REFERENCES

10.1 Letter dated July 15, 1996 from Kristine M. Thomas, NRC to Donald Schnell, Union Electric Company, "Callaway Plant - Amendment No. 114 to Facility Operating License No. NPF-30 (TAC No. M94456)."

10.2 Letter dated September 26, 2000 from Jack A. Donohew, NRC to Garry L. Randolph, Union Electric Company, "Callaway Plant - Amendment No. 138 to Facility Operating License No. NPF-30 (TAC No. MA9591)."

10.3 FSAR Section 15.7.4, "Fuel Handling Accidents."

10.4 NUMARC 93-01, Revision 3, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," July 2000.

10.5 NUREG-0800, Standard Review Plan, Section 15.7.4, Rev. 1, July 1981.

10.6 FSAR Section 16.3, "Instrumentation."

10.7 FSAR Section 16.9, "Refueling Operations."

10.8 FSAR Section 16.11,"Offsite Dose Calculation Manual, Radioactive Effluent Controls."

ULNRC- 04674

ATTACHMENT 3

MARKUP OF TECHNICAL SPECIFICATION PAGES

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ------------- NOTE------------- Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ------------------------------------- One ~~or more Functions with one~~ or more manual channels ~~or automatic actuation trains~~ inoperable. ~~OR~~ ~~Both radiation monitoring channels inoperable.~~ ~~OR~~ ~~Required Action and associated Completion Time for Condition A not met.~~	C.1	Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
	<u>OR</u>		
	C.2	Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust valves made inoperable by isolation instrumentation.	Immediately

Table 3.3.6-1 (page 1 of 1)
Containment Purge Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, (a), (b)	2	SR 3.3.6.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, ~~(a), (b)~~	2 trains	SR 3.3.6.2 SR 3.3.6.6	NA
3.	Containment Purge Exhaust Radiation - Gaseous	1, 2, 3, 4, ~~(a), (b)~~	2	SR 3.3.6.1 SR 3.3.6.3 SR 3.3.6.5	(c)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) Set to ensure ODCM limits are not exceeded.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.	Immediately
	AND		
	C.1.2	Place one CREVS train in CRVIS mode.	1 hour
	OR		
	C.2	Place both trains in CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions 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 Conditions A, B, or C not met in MODE 5 or 6, or **during CORE ALTERATIONS, 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
SR 3.3.7.3	-----NOTE----- The continuity check may be excluded. ----- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.7.4	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	18 months
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	18 months

INSERT A (3.3.7)

INSERT A (3.3.7)

SR 3.3.7.6	**------------------------NOTE--------------------** **Radiation monitor detectors are excluded from response time testing.** **--** **Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits.**	**18 months on a STAGGERED TEST BASIS**

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

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, 5, 6, (a), **and (c)**	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, 5, 6, (a), **and (c)**	2 trains	SR 3.3.7.3	NA
		(a)	**2 trains**	**SR 3.3.7.6**	**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)
		(a)	**2**	**SR 3.3.7.6**	**(b)**
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			
5.	**Fuel Building Exhaust Radiation -Gaseous**	**Refer to LCO 3.3.8, "EES Actuation Instrumentation," for all initiation functions and requirements.**			

(a) During **CORE ALTERATIONS or during** movement of irradiated fuel assemblies **within containment**.

(b) Nominal Trip Setpoint concentration value ($\mu Ci/cm^3$) shall be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.

(c) During movement of irradiated fuel assemblies in the fuel building.

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

-----NOTE-----
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
	<u>AND</u>	
	A.2 Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	**7 days**

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ------------NOTE------------ Not applicable to Function 3. ------------------------------	B.1.1	Place one EES train in the FBVIS mode **and one CREVS train in the CRVIS mode**.	Immediately
	AND		
One or more Functions with two channels or two trains inoperable. INSERT A (3.3.8)	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately INSERT B (3.3.8)
	OR		
	B.2	Place both **EES** trains in the FBVIS mode.	Immediately
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately INSERT C (3.3.8)
	AND		
	C.1.2	Place one EES train in the FBVIS mode.	1 hour INSERT B (3.3.8)
	OR		
	C.2	Place both **EES** trains in the FBVIS mode.	1 hour

(continued)

INSERT A (3.3.8)

of LCO 3.7.10, “Control Room Emergency Ventilation System (CREVS),” for one CREVS train made inoperable and enter applicable Conditions and Required Actions

INSERT B (3.3.8)

and both CREVS trains in the CRVIS mode.

INSERT C (3.3.8)

and one CREVS train in the CRVIS mode.

3.9 REFUELING OPERATIONS

3.9.4 Containment Penetrations

LCO 3.9.4 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts, **or if open, capable of being closed**;

b. One door in the emergency air lock ~~closed~~ and one door in the personnel air lock capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge Isolation valve.

------------------------------------NOTE------------------------------------
Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.4.23	Verify each required containment purge isolation valve actuates to the isolation position on **a** ~~an actual or simulated~~ **manual** actuation signal.	18 months

INSERT A (3.9.4)

INSERT A (3.9.4)

SR 3.9.4.2	------------------------NOTE------------------------------ Only required for an open equipment hatch. -- Verify the capability to install the equipment hatch.	 7 days

ULNRC- 04674

ATTACHMENT 4

RETYPED MARKUP OF TECHNICAL SPECIFICATION PAGES

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ------------- NOTE------------- Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ------------------------------------- One or more manual channels inoperable.	C.1	Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
	<u>OR</u>		
	C.2	Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust valves made inoperable by isolation instrumentation.	Immediately

Table 3.3.6-1 (page 1 of 1)
Containment Purge Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, (a), (b)	2	SR 3.3.6.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4,	2 trains	SR 3.3.6.2 SR 3.3.6.6	NA
3.	Containment Purge Exhaust Radiation - Gaseous	1, 2, 3, 4,	2	SR 3.3.6.1 SR 3.3.6.3 SR 3.3.6.5	(c)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) Set to ensure ODCM limits are not exceeded.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.	Immediately
	<u>AND</u>		
	C.1.2	Place one CREVS train in CRVIS mode.	1 hour
	<u>OR</u>		
	C.2	Place both trains in CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions A, B, or C not met in MODE 1, 2, 3, or 4.	D.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	D.2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Conditions A, B, or C not met in MODE 5 or 6, or during CORE ALTERATIONS, or during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	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
SR 3.3.7.3	--------------------------NOTE-------------------------- The continuity check may be excluded. -- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.7.4	--------------------------NOTE-------------------------- Verification of setpoint is not required. -- Perform TADOT.	18 months
SR 3.3.7.5	Perform CHANNEL CALIBRATION.	18 months
SR 3.3.7.6	--------------------------NOTE-------------------------- Radiation monitor detectors are excluded from response time testing. -- Verify Control Room Ventilation Isolation ESF RESPONSE TIMES are within limits.	18 months on a STAGGERED TEST BASIS

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	NOMINAL TRIP SETPOINT
1. Manual Initiation	1, 2, 3, 4, 5, 6, (a), and (c)	2	SR 3.3.7.4	NA
2. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, 5, 6, (a), and (c)	2 trains	SR 3.3.7.3	NA
	(a)	2 trains	SR 3.3.7.6	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)
	(a)	2	SR 3.3.7.6	(b)
4. Containment Isolation – Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			
5. Fuel Building Exhaust Radiation – Gaseous	Refer to LCO 3.3.8, "EES Actuation Instrumentation," for all initiation functions and requirements.			

(a) During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.
(b) Nominal Trip Setpoint concentration value ($\mu Ci/cm^3$) shall be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.
(c) During movement of irradiated fuel assemblies in the fuel building.

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

---NOTE---
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
	AND		
	A.2	Place one CREVS train in Control Room Ventilation Isolation Signal (CRVIS) mode.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. --------------NOTE------------- Not applicable to Function 3. ----------------------------------	B.1.1	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	Immediately
	<u>AND</u>		
One or more Functions with two channels or two trains inoperable.	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable and enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately
	<u>OR</u>		
	B.2	Place both EES trains in the FBVIS mode and both CREVS trains in the CRVIS mode.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Both radiation monitoring channels inoperable.	C.1.1	Enter applicable Conditions and Required Actions of LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," for one CREVS train made inoperable and enter applicable Conditions and Required Actions of LCO 3.7.13, "Emergency Exhaust System (EES)," for one EES train made inoperable by inoperable EES actuation instrumentation.	Immediately
	AND		
	C.1.2	Place one EES train in the FBVIS mode and one CREVS train in the CRVIS mode.	1 hour
	OR		
	C.2	Place both EES trains in the FBVIS mode and both CREVS trains in the CRVIS mode.	1 hour
D. Required Action and associated Completion Time for Conditions A, B, or C not met during movement of irradiated fuel assemblies in the fuel building.	D.1	Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

--NOTE--
Refer to Table 3.3.8-1 to determine which SRs apply for each EES Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.8.2	Perform COT.	92 days
SR 3.3.8.3	------------------------------NOTE------------------------------ The continuity check may be excluded. -- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.8.4	------------------------------NOTE------------------------------ Verification of setpoint is not required. -- Perform TADOT.	18 months
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	18 months

3.9 REFUELING OPERATIONS

3.9.4 Containment Penetrations

LCO 3.9.4 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts, or if open, capable of being closed;

b. One door in the emergency air lock and one door in the personnel air lock capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge Isolation valve.

------------------------------------ NOTE ------------------------------------
Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.4.2	---------------------------NOTE--------------------------- Only required for an open equipment hatch. --- Verify the capability to install the equipment hatch.	7 days
SR 3.9.4.3	Verify each required containment purge isolation valve actuates to the isolation position on a manual actuation signal.	18 months

ULNRC- 04674

ATTACHMENT 5

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES

(for information only)

B 3.3 INSTRUMENTATION

B 3.3.6 Containment Purge Isolation Instrumentation

BASES

BACKGROUND

Containment purge isolation instrumentation closes the containment isolation valves in the Mini-purge System and the Shutdown Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The Mini-purge System may be in use during reactor operation and the Shutdown Purge System will be in use with the reactor shutdown.

Containment purge isolation initiates on an automatic or manual safety injection (SI) signal through the Containment Isolation - Phase A Function, or by manual actuation of Phase A Isolation. The Bases for LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," discuss these modes of initiation.

Two gaseous radiation monitoring channels are also provided as input to the containment purge isolation. The two channels measure gaseous radiation in a sample of the containment purge exhaust. Since the purge exhaust monitors constitute a sampling system, various components such as sample line valves and sample pumps are required to support monitor OPERABILITY.

Each of the purge systems has inner and outer containment isolation valves in its supply and exhaust ducts. A high radiation signal from either of the two radiation monitoring channels initiates containment purge isolation, which closes both inner and outer containment isolation valves in the Mini-purge System and the Shutdown Purge System. These systems are described in the Bases for LCO 3.6.3, "Containment Isolation Valves."

APPLICABLE SAFETY ANALYSES

The safety analyses assume that the containment remains intact with penetrations unnecessary for core cooling isolated early in the event. The isolation of the purge valves has not been analyzed mechanistically in the dose calculations, although its rapid isolation is assumed. The containment purge isolation gaseous radiation channels act as backup to the Phase A isolation signal to ensure closing of the purge supply and exhaust valves. ~~They are also the means for automatically isolating containment in the event of a fuel handling accident during shutdown; however, the dose calculations performed in support of Reference 5 do not assume automatic isolation (see also the Bases for LCO 3.9.4, "Containment Penetrations").~~ [INSERT A (B3.3.6)] Containment isolation ~~in turn~~ ensures

(continued)

INSERT A (B 3.3.6)

In the postulated fuel handling accident, the dose calculations performed in support of Reference 5 (open personnel airlock during CORE ALTERATIONS and during movement of irradiated fuel assemblies within containment) do not assume automatic containment purge isolation (see also the Bases for LCO 3.9.4, "Containment Penetrations").

BASES

APPLICABLE SAFETY ANALYSES (continued)

meeting the containment leakage rate assumptions of the safety analyses, and ensures that the calculated accidental offsite radiological doses are below 10 CFR 100 (Ref. 1) limits.

The containment purge isolation instrumentation satisfies Criterion 3 of 10CFR50.36(c)(2)(ii).

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment Purge Isolation, listed in Table 3.3.6-1, is OPERABLE.

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate Containment Purge Isolation at any time by using either of two push buttons in the control room.

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.

INSERT B (B3.3.6)

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

The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE to ensure that no single random failure can prevent automatic actuation of containment purge isolation.

Automatic Actuation Logic and Actuation Relays (BOP ESFAS) consist of the same features and operate in the same manner as described for ESFAS Function 6.c, Auxiliary Feedwater.

3. Containment Purge Exhaust Radiation - Gaseous

The LCO specifies two required Containment Purge Exhaust Radiation – Gaseous channels (GTRE0022 and GTRE0033) to ensure that the radiation monitoring instrumentation necessary to initiate Containment Purge Isolation remains OPERABLE.

(continued)

INSERT B (B 3.3.6)

as well as the BOP ESFAS output actuation relays needed to effect a manual containment purge isolation.

BASES

LCO

3. Containment Purge Exhaust Radiation - **Gaseous** (continued)

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the 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

Containment Purge Isolation is also initiated by all Table 3.3.2-1 Functions that initiate Containment Isolation - Phase A. Therefore, the requirements are not repeated in Table 3.3.6-1. Instead, refer to LCO 3.3.2, Function 3.a, for all initiating Functions and requirements.

APPLICABILITY

INSERT C (B3.3.6)

INSERT D (B3.3.6)

The Manual Initiation, Automatic Actuation Logic and Actuation Relays (BOP ESFAS), ~~Containment Isolation - Phase A,~~ and Containment Purge Exhaust Radiation - Gaseous Functions are required OPERABLE in MODES 1, 2, 3, and 4. The Containment Purge ~~Exhaust Radiation - Gaseous,~~ Manual Initiation **Function**, ~~and BOP ESFAS Logic Functions are~~ **is** also required OPERABLE during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. ~~Under these conditions,~~ the potential exists ~~for an accident~~ that could release fission ~~product radioactivity~~ into containment. Therefore, the containment purge isolation instrumentation must be OPERABLE in these MODES.

While in MODES 5 and 6 without CORE ALTERATIONS or irradiated fuel movement within containment in progress, the containment purge isolation instrumentation need not be OPERABLE since the potential for radioactive releases is minimized and operator action is sufficient to ensure post accident offsite doses are maintained within the limits of Reference 1.

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 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 measured Trip Setpoint is less conservative

(continued)

INSERT C (B 3.3.6)

The Containment Isolation – Phase A Function is required to be OPERABLE as directed by LCO 3.3.2, Function 3.a.

INSERT D (B 3.3.6)

During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment, automatic actuation functions of the containment purge isolation gaseous radiation channels are not required to be OPERABLE.

The automatic actuation logic and actuation relays for the Containment Purge Exhaust Radiation – Gaseous channels (GTRE0022 and GTRE0033) are not required to be OPERABLE during CORE ALTERATIONS or during the movement of irradiated fuel assemblies within containment, except for those BOP ESFAS output actuation relays needed to effect a manual containment purge isolation. If required, the containment purge isolation can be initiated manually from the control room.

In MODES 1, 2, 3, 4, and the other conditions discussed above,

BASES

ACTIONS (continued)

C.1 and C.2

Condition C applies to the Manual Initiation **Function**~~, Automatic BOP ESFAS Actuation Logic and Actuation Relays, and Containment Purge Exhaust Radiation - **Gaseous** Functions and addresses the train orientation of the BOP ESFAS. It also addresses the failure of both **gaseous** radiation monitoring channels, or the inability to restore a single failed **gaseous** radiation monitoring channel to OPERABLE status in the time allowed for Required Action A.1.~~ If one or more ~~BOP ESFAS logic trains or~~ manual initiation channels are inoperable~~, both **gaseous** radiation monitoring channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met,~~ operation may continue as long as the Required Action to place and maintain containment purge supply and exhaust valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately.

A Note states that Condition C is applicable during CORE ALTERATIONS ~~and~~ **or** during movement of irradiated fuel assemblies within containment.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Purge Isolation Functions.

SR 3.3.6.1

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

(continued)

B 3.3 INSTRUMENTATION

B 3.3.7 Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation

BASES

BACKGROUND

The CREVS provides an enclosed control room environment from which the unit can be operated following an uncontrolled release of radioactivity. During normal operation, the Control Building Ventilation System provides control room ventilation. Upon receipt of an actuation signal, the CREVS initiates filtered ventilation and pressurization of the control room. This system is described in the Bases for LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)."

The actuation instrumentation consists of two gaseous radiation channels in the control room air intake. A high radiation signal from either of these channels will initiate both trains of the CREVS. Since the radiation monitors include an air sampling system, various components such as sample line valves and sample pumps are required to support monitor OPERABILITY. The control room operator can also initiate CREVS trains by manual switches in the control room. The CREVS is also actuated by a Phase A Isolation signal, a Fuel Building Ventilation Isolation signal (FBVIS), or a high radiation signal from the containment purge exhaust gaseous radiation channels. The Phase A Isolation Function is discussed in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation."

APPLICABLE SAFETY ANALYSES

The control room must be kept habitable for the operators stationed there during accident recovery and post accident operations.

The CREVS acts to terminate the supply of unfiltered outside air to the control room, initiate filtration, and pressurize the control room. These actions are necessary to ensure the control room is kept habitable for the operators stationed there during accident recovery and post accident operations by minimizing the radiation exposure of control room personnel.

In MODES 1, 2, 3, and 4 **(MODE 4 is subject to LCO 3.3.2, Function 3.a)**, the gaseous **radiation** channel actuation of the CREVS is a backup for the Phase A Isolation signal actuation. This ensures initiation of the CREVS during a loss of coolant accident or steam generator tube rupture.

The gaseous radiation channel actuation of the CREVS in MODES 5 and 6, ~~and~~ **during CORE ALTERATIONS, or** during movement of irradiated fuel assemblies **within containment** is the primary

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

means to ensure control room habitability in the event of a fuel handling accident or waste gas decay tank rupture accident. The probability of a waste gas decay tank rupture accident occurring during the period of time outside the Applicability (i.e., not in MODES 1-6 and with no movement of irradiated fuel assemblies occurring) is insignificant. There are no safety analyses that take credit for CREVS actuation upon an FBVIS or a high containment purge exhaust radiation.

INSERT A (B 3.3.7)

INSERT B (B 3.3.7)

The CREVS actuation instrumentation satisfies Criterion 3 of 10CFR50.36(c)(2)(ii).

INSERT C (B 3.3.7)

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.

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 control room ventilation isolation.

Automatic Actuation Logic and Actuation Relays (BOP ESFAS) consist of the same features and operate in the same manner as described for ESFAS Function 6.c, Auxiliary Feedwater.

3. Control Room Radiation – Control Room Air Intake

The LCO specifies two required Control Room Radiation Monitor – Control Room Air Intake gaseous channels (GKRE0004 and GKRE0005) to ensure that the radiation monitoring

(continued)

INSERT A (B 3.3.7)

inside containment

INSERT B (B 3.3.7)

of Functions 1 – 3 of Table 3.3.7-1

INSERT C (B 3.3.7)

A FBVIS is credited to protect the control room in the event of a design basis fuel handling accident inside the fuel building.

Sources of control room ventilation isolation signal (CRVIS) initiation which are remote from the Control Room intake louvers are not response time tested. For example, GGRE0027 and GGRE0028, which monitor Fuel Building exhaust are not response time tested. The analysis does credit a FBVIS for actuating a CRVIS following a Fuel Handling Accident in the Fuel Building. Due to the remote location of the Fuel Building exhaust radiation monitors relative to the Control Room intake louvers, the FBVIS will isolate the Control Room prior to the post-accident radioactive plume reaching the Control Room intake louvers.

Similarly, for a LOCA, the analysis credits a time zero Control Room isolation. A Safety Injection signal initiates a Containment Isolation Phase A, which initiates a CRVIS. This function is also credited for isolating the Control Room prior to the post-accident radioactive plume reaching the Control Room intake louvers.

For a Fuel Handling Accident within Containment, GKRE0004 and GKRE0005 are credited for initiating a CRVIS. These monitors are not remote from the Control Room intake louvers. They are downstream of the Control Room intake. Therefore, a specific response time is modeled, and a response time Surveillance Requirement is imposed for this CRVIS function.

BASES

LCO

3. Control Room Radiation – Control Room Air Intake (continued)

instrumentation necessary to initiate the CREVS 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. The required radiation monitors' OPERABILITY is not dependent on forced flow in the control room supply duct. GKRE0004 and GKRE0005 OPERABILITY is not dependent on the status of GKHZ0013D/0057A/0150/0151, SGK02, or CGK01A and B. GKRE0004 and GKRE0005 may be considered OPERABLE with CREVS in the CRVIS mode of operation.

4. Containment Isolation - Phase A

INSERT D (B 3.3.7)

Control Room Ventilation Isolation is also initiated by all Table 3.3.2-1 Functions that initiate Containment Isolation - 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, including actuation on the Containment Isolation - Phase A Function, must be OPERABLE in MODES 1, 2, 3, and 4.~~ The Manual Initiation, Automatic Actuation Logic and Actuation Relays (BOP ESFAS), and Control Room Radiation – Control Room Air Intake Functions ~~are also required~~ **must be** OPERABLE in MODES **1, 2, 3, 4,** 5, and 6, ~~and~~ during **CORE ALTERATIONS , or during** movement of irradiated fuel assemblies~~.~~ These Functions must 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.

INSERT E (B 3.3.7)

INSERT F (B 3.3.7)

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. It the measured Trip Setpoint is less conservative than the tolerance specified by the calibration

(continued)

INSERT D (B 3.3.7)

5. Fuel Building Exhaust Radiation – Gaseous

Control Room Ventilation Isolation is also initiated by high radiation in the fuel building detected by Fuel Building Exhaust Radiation – Gaseous channels (GGRE0027 and GGRE0028). The requirements are not repeated in Table 3.3.7-1. Instead, refer to LCO 3.3.8 for all initiating Functions and requirements.

INSERT E (B 3.3.7)

within containment.

INSERT F (B 3.3.7)

During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment, these Functions assure the generation of a CRVIS on detection of high gaseous activity in the event of a fuel handling accident within containment.

During movement of irradiated fuel assemblies in the fuel building, the Fuel Building Exhaust Radiation – Gaseous channels (GGRE0027 and GGRE0028) assure the generation of a CRVIS on detection of high gaseous activity in the event of a fuel handling accident in the fuel building. Since this FBVIS-initiated CRVIS requires Function 2 of Table 3.3.7-1 to complete the actuation circuit, and since manual CRVIS actuation provides back-up, Functions 1 and 2 of Table 3.3.7-1 must also be OPERABLE during movement of irradiated fuel assemblies in the fuel building.

The Containment Isolation – Phase A Function is required to be OPERABLE as directed by LCO 3.3.2, Function 3.a. The Fuel Building Exhaust Radiation – Gaseous Function is required to be OPERABLE as directed by LCO 3.3.8, Functions 1, 2, and 3.

BASES

ACTIONS (continued)

procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to the ACTIONS indicating that separate Condition entry is allowed for each Function. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.7-1 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 CREVS train(s) in the CRVIS mode of operation isolates the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through HEPA filters and charcoal adsorbers. This mode of operation also initiates pressurization and filtered ventilation of the air supply to the control room. Further discussion of the CRVIS mode of operation may be found in the Bases for LCO 3.7.10, "Control Room Emergency Ventilation System (CREVS)," and in Reference 1.

A.1

Condition A applies to ~~all~~ CREVS Functions **1, 2, and 3** (i.e., the actuation logic train Function of the BOP ESFAS, the gaseous radiation monitor channel Function, and the manual initiation channel Function).

If one channel or train is inoperable, or one gaseous radiation monitor channel is inoperable, 7 days are permitted to restore it to OPERABLE status. The 7 day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this Completion Time is the same as provided in LCO 3.7.10. If the channel/train cannot be restored to OPERABLE status, one CREVS train must be placed in the Control Room Ventilation Isolation Signal (CRVIS) mode of operation. This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation.

B.1.1, B.1.2, and B.2

Condition B applies to the failure of two CREVS actuation logic trains (BOP ESFAS) or two manual initiation channels. Condition B is modified by a Note stating this Condition is not applicable to Function 3. Function 3 in Table 3.3.7-1 applies to the Control Room Radiation - Control Room Air Intake gaseous channels. The first Required Action is to place one CREVS train in the CRVIS mode of operation immediately.

(continued)

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 in MODE 5 or 6, **or during CORE ALTERATIONS,** 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.

Either the RM-11 or RM-23 displays may be used to perform the CHANNEL CHECK for the Control Room Radiation - Control Room Air Intake gaseous channels (GKRE0004 and GKRE0005).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.4 (continued)

operating experience. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The channels tested have no setpoints associated with them.

SR 3.3.7.5

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

INSERT G (B 3.3.7)

REFERENCES

1. FSAR Section 7.3.4 and Table 7.3-8.

2. **FSAR Table 16.3-2.**

INSERT G (B 3.3.7)

SR 3.3.7.6

SR 3.3.7.6 is the performance of the required response time verification every 18 months on a STAGGERED TEST BASIS on those functions with time limits provided in Reference 2. Each verification shall include at least one train such that both trains are verified at least once per 36 months.

SR 3.3.7.6 is modified by a Note stating that the radiation monitor detectors are excluded from ESF RESPONSE TIME testing. The Note is necessary because of the difficulty associated with generating an appropriate radiation monitor detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response. Response time of the channel shall be verified from the detector output or input to the first electronic component in the channel.

B 3.3 INSTRUMENTATION

B 3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

BASES

BACKGROUND

The EES ensures that radioactive materials in the fuel building atmosphere following a fuel handling accident are filtered and adsorbed prior to exhausting to the environment. The system is described in the Bases for LCO 3.7.13, "Emergency Exhaust System." The system initiates filtered exhaust from the fuel building following receipt of a fuel building ventilation isolation signal (FBVIS), initiated manually or automatically upon a high radiation signal (gaseous).

High gaseous radiation, monitored by two channels, provides an FBVIS. Both EES trains are initiated by high radiation detected by either channel. Each channel contains a gaseous monitor. High radiation detected by either monitor initiates fuel building isolation, ~~and~~ starts the EES, **and initiates a CRVIS**. These actions function to prevent exfiltration of contaminated air by initiating filtered exhaust, which imposes a negative pressure on the fuel building. Since the radiation monitors include an air sampling system, various components such as sample line valves and sample pumps are required to support monitor OPERABILITY. In the FBVIS mode, each train is capable of maintaining the fuel building at a negative pressure of less than or equal to 0.25 inches water gauge relative to the outside atmosphere.

The EES is also actuated in the LOCA (SIS) mode as described in the Bases for LCO 3.3.2, "ESFAS Instrumentation."

APPLICABLE SAFETY ANALYSES

The EES ensures that radioactive materials in the fuel building atmosphere following a fuel handling accident are filtered and adsorbed prior to being exhausted to the environment. This action reduces the radioactive content in the fuel building exhaust following a fuel handling accident so that offsite doses remain within the limits specified in 10 CFR 100 (Ref. 1) **and control room habitability is maintained**.

The EES actuation instrumentation satisfies Criterion 3 of 10CFR50.36(c)(2)(ii).

LCO

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

(continued)

BASES

LCO (continued)

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the EES at any time by using either of two push buttons in the control room.

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. This consists of the same features and operates in the same manner as described for ESFAS Function 6.c, Auxiliary Feedwater.

3. Fuel Building Exhaust Radiation - Gaseous

The LCO specifies two required Fuel Building Exhaust Radiation – Gaseous channels (GGRE0027 and GGRE0028) to ensure that the radiation monitoring instrumentation necessary to initiate the FBVIS **and CRVIS** remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY also requires correct valve lineups, sample pump operation, and detector OPERABILITY, since these supporting features are necessary for actuation to occur under the conditions assumed by the safety analyses. The required radiation monitors remain OPERABLE if one or both Emergency Exhaust System trains are inoperable or following a Fuel Building Ventilation Isolation Signal (FBVIS). Both required radiation monitors remain OPERABLE if the normal Fuel Building exhaust flow is isolated.

The submersion dose rate basis for the nominal Trip Setpoint is specified for the gaseous monitors in the LCO. The nominal Trip Setpoint accounts for instrument uncertainties.

(continued)

BASES (continued)

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 **and isolate control room ventilation**.

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 **and a CRVIS** when the potential for a fuel handling accident exists.

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 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 measured 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.

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 (EES)," and in Reference 2.

A.1

Condition A applies to the actuation logic train Function of the BOP ESFAS, the **gaseous** radiation monitor channel Function, and the manual initiation channel Function. Condition A applies to the failure of a single actuation logic train, **gaseous** radiation monitor channel, or manual initiation channel. If one channel or train is inoperable, or one **gaseous** radiation monitor channel is inoperable, a period of 7 days is allowed to

(continued)

BASES

ACTIONS

A.1 (continued)

restore it to OPERABLE status. If the channel or train cannot be restored to OPERABLE status, one EES train must be placed in the FBVIS mode of operation. This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation. The 7 day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this time is the same as that provided in LCO 3.7.13.

INSERT A (B 3.3.8)

B.1.1, B.1.2, and B.2

INSERT B (B 3.3.8)

INSERT C (B 3.3.8)

Condition B applies to the failure of two EES actuation logic trains (BOP ESFAS) or two manual initiation channels. Condition B is modified by a Note stating this Condition is not applicable to Function 3. Function 3 in Table 3.3.8-1 covers the Fuel Building Exhaust Radiation – Gaseous channels. The first Required Action is to place one EES train in the FBVIS mode of operation immediately. This accomplishes the actuation instrumentation Function that has been lost and places the unit in a conservative mode of operation. The applicable Conditions and Required Actions of LCO 3.7.13 must also be entered immediately for one EES train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed on train inoperability as discussed in the Bases for LCO 3.7.13 **and LCO 3.7.10**.

INSERT D (B 3.3.8)

Alternatively, both **EES** trains may be placed in the FBVIS mode immediately. This ensures the EES function is performed even in the presence of a single failure.

INSERT E (B 3.3.8)

C.1.1, C.1.2, and C.2

Condition C applies to the failure of both gaseous radiation monitoring channels. The first Required Action is to enter the applicable Conditions and Required Actions of LCO 3.7.13 immediately for one EES train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed upon train inoperability as discussed in the Bases for LCO 3.7.13 **and LCO 3.7.10**. One EES train must also be placed in the FBVIS mode of operation within 1 hour. This accomplishes the actuation instrumentation Function that has been lost and places the unit in a conservative mode of operation. The 1 hour Completion Time allows for activities such as changing sample filters on the OPERABLE channel while in Condition A, which requires entry into Condition C.

INSERT F (B 3.3.8)

(continued)

INSERT A (B 3.3.8)

and one CREVS train must be placed in the CRVIS mode.

INSERT B (B 3.3.8)

and one CREVS train in the CRVIS mode of operation

INSERT C (B 3.3.8)

and the applicable Conditions and Required Actions of LCO 3.7.10 must be entered immediately for one CREVS train made inoperable

INSERT D (B 3.3.8)

and both CREVS trains in the CRVIS mode

INSERT E (B 3.3.8)

and the applicable Conditions and Required Actions of LCO 3.7.10 must be entered immediately for one CREVS train made inoperable

INSERT F (B 3.3.8)

and one CREVS train in the CRVIS mode of operation

BASES

INSERT G (B 3.3.8)

ACTIONS

C.1.1, C.1.2, and C.2 (continued)

Alternatively, both **EES** trains may be placed in the FBVIS mode within 1 hour. This ensures the EES function is performed even in the presence of a single failure.

D.1

Condition D applies when the Required Action and associated Completion Time for Conditions A, B, or C have not been met and irradiated fuel assemblies are being moved in the fuel building. Movement of irradiated fuel assemblies in the fuel building must be suspended immediately to eliminate the potential for events that could require EES actuation. This does not preclude movement of a fuel assembly to a safe position.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.8-1 determines which SRs apply to which EES Actuation Functions.

SR 3.3.8.1

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,

(continued)

INSERT G (B 3.3.8)

and both CREVS trains in the CRVIS mode

BASES

LCO (continued)

path can also render the CREVS flow path inoperable. In these situations, LCOs 3.7.10 and 3.7.11 may be applicable.

APPLICABILITY

In MODES 1, 2, 3, **and** 4~~, 5, and 6, and during movement of irradiated fuel assemblies,~~ CREVS must be OPERABLE to control operator exposure during and following ~~a DBA~~ **LOCA or SGTR**.

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

During movement of irradiated fuel assemblies, the CREVS must be OPERABLE to cope with the release from a design basis fuel handling accident **inside containment or in the fuel building**.

ACTIONS

A.1

When one CREVS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREVS train is adequate to perform the control room protection function. However, the overall reliability is reduced because a single 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

If the control room boundary is inoperable in MODE 1, 2, 3, and 4 such that neither CREVS train can establish the required positive pressure, action must be taken to restore an OPERABLE control room boundary within 24 hours. During the period that the control room boundary is inoperable, appropriate compensatory measures (consistent with the intent GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Compensatory measures address entries into Condition B. See also the LCO Bases above. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, the availability of the CREVS to provide a filtered environment (albiet with potential control room inleakage), and the use of compensatory measures. The 24 hour Completion Time is a reasonable time to diagnose, plan, repair, and test most problems with the control room boundary.

(continued)

BASES

ACTIONS (continued)

F.1

If both CREVS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than an inoperable control room 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 severe, testing each train once every month, by initiating from the control room, flow through the HEPA filters and charcoal adsorbers 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 functioning. Functioning heaters will not necessarily have the heating elements energized continuously for 10 hours; but will cycle depending on the air temperature. 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 availability.

SR 3.7.10.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP).

The CREVS filter tests use the test procedure guidance in Regulatory Guide 1.52 (Ref. 3). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.3

INSERT A (B 3.7.10)

This SR verifies that each CREVS train starts and operates on an actual or simulated actuation signal. The actuation signal includes Control Room Ventilation Isolation or ~~High Gaseous Radioactivity~~. The CREVS train automatically switches on an actual or simulated CRVIS signal into a

(continued)

INSERT A (B 3.7.10)

Fuel Building Ventilation Isolation.

B 3.7 PLANT SYSTEMS

B 3.7.13 Emergency Exhaust System (EES)

BASES

BACKGROUND

The Emergency Exhaust System serves both the auxiliary building and the fuel building. Following a safety injection signal (SIS), safety related dampers isolate the auxiliary building, and the Emergency Exhaust System exhausts potentially contaminated air due to leakage from ECCS systems. The Emergency Exhaust System also can filter airborne radioactive particulates from the area of the fuel pool following a fuel handling accident.

The Emergency Exhaust System 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 Emergency Exhaust System is on standby for an automatic start following receipt of a fuel building ventilation isolation signal (FBVIS) or a safety injection signal (SIS). Initiation of the SIS mode of operation takes precedence over any other mode of operation. In the SIS mode, the system is aligned to exhaust the auxiliary building. The instrumentation associated with actuation of the SIS mode of operation is addressed in LCO 3.3.2, ESFAS Instrumentation.

Upon receipt of a fuel building ventilation isolation signal generated by gaseous radioactivity monitors in the fuel building exhaust line, normal air discharges from the building are terminated, the fuel building is isolated, ~~and~~ the stream of ventilation air discharges through the system filter trains. The instrumentation associated with actuation of the FBVIS mode of operation is addressed in LCO 3.3.8, EES Actuation Instrumentation.

INSERT A (B 3.7.13)

The Emergency Exhaust System is discussed in the FSAR, Sections 6.5.1, 9.4.2, 9.4.3, and 15.7.4 (Refs. 1, 2, 3 and 4 respectively) because it may be used for normal, as well as post accident, atmospheric cleanup functions.

APPLICABLE SAFETY ANALYSES

The Emergency Exhaust System design basis is established by the consequences of two Design Basis Accidents (DBAs), which are a loss of coolant accident (LOCA) and a fuel handling accident (FHA). The analysis of the fuel handling accident, given in Reference 4, assumes that

(continued)

INSERT A (B 3.7.13)

, and a control room ventilation isolation signal (CRVIS) is generated.

BASES

SURVEILLANCE REQUIREMENTS (continued)

INSERT B (B 3.7.13)

SR 3.7.13.3

This SR verifies that each Emergency Exhaust System train starts and operates on an actual or simulated actuation signals. These actuation signals include a Safety Injection Signal (applicable in MODE 1, 2, 3 and 4) and Spent Fuel Pool Gaseous Radioactivity Signal (applicable during movement of irradiated fuel in the fuel building). The 18 month Frequency is consistent with the typical operating cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

During emergency operations the Emergency Exhaust System will automatically start in either the SIS or FBVIS lineup depending on the initiating signal. In the SIS lineup, the fans operate with dampers aligned to exhaust from the Auxiliary Building and prevent unfiltered leakage. In the FBVIS lineup, which is initiated on a Spent Fuel Pool Gaseous Radioactivity - High Signal, the fans operate with the dampers aligned to exhaust from the Fuel Building to prevent unfiltered leakage. Normal exhaust air from the Fuel Building is continuously monitored by radiation detectors. One detector output will automatically align the Emergency Exhaust System in the FBVIS mode of operation. This surveillance requirement demonstrates that each Emergency Exhaust System train can be automatically started and properly configured to the FBVIS or SIS alignment, as applicable, upon receipt of an actual or simulated SIS signal and an FBVIS signal. It is not required that each Emergency Exhaust System train be started from both actuation signals during the same surveillance test provided each actuation signal is tested independently within the 18 month test frequency.

SR 3.7.13.4

This SR verifies the integrity of the auxiliary building enclosure. The ability of the auxiliary building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the Emergency Exhaust System. During the SIS mode of operation, the Emergency Exhaust System is designed to maintain a slight negative pressure in the auxiliary building, to prevent unfiltered leakage. The Emergency Exhaust System is designed to maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure at the flow rate specified in the VFTP. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 7).

(continued)

INSERT B (B 3.7.13)

high radiation signal from the Fuel Building Exhaust Radiation – Gaseous channels

B 3.9 REFUELING OPERATIONS

B 3.9.4 Containment Penetrations

BASES

BACKGROUND

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, a release of fission product radioactivity within containment will be restricted from escaping to the environment when the LCO requirements are met. In MODES 1, 2, 3, and 4, this is accomplished by maintaining containment OPERABLE as described in LCO 3.6.1, "Containment." In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, requirements to isolate the containment from the outside atmosphere can be less stringent. The LCO requirements are referred to as "containment closure" rather than "containment OPERABILITY." Containment closure means that all potential escape paths are closed or capable of being closed. Since there is no potential for containment pressurization, the 10 CFR 50 Appendix J leakage criteria and tests are not required.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10 CFR 100. Additionally, the containment provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment **and if closed**, the **containment** equipment hatch must be held in place by at least four bolts. **Alternatively, the equipment hatch can be open provided it can be installed with a minimum of four bolts holding it in place.** Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced.

INSERT A (B 3.9.4)

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 unit operation in accordance with LCO 3.6.2, "Containment Air Locks." ~~Each air lock has a door at both ends.~~ The doors are ~~normally~~ interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of unit shutdown when containment closure is not required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. During CORE ALTERATIONS or movement of irradiated fuel assemblies within

(continued)

INSERT A (B 3.9.4)

The personnel air lock is nominally a right circular cylinder, approximately 10 ft in diameter with a door at each end. The emergency air lock is approximately 5 ft 9 in inside diameter with a 2 ft 6 in door at each end.

BASES

BACKGROUND (continued)

containment, containment closure is required. The door interlock mechanism may remain disabled; however, one personnel air lock door ~~must be capable of being closed~~ and one emergency air lock door must be ~~closed~~ **capable of being closed**.

INSERT B (B 3.9.4)

The requirements for containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment. The closure restrictions are sufficient to restrict fission product radioactivity release from containment due to a fuel handling accident during refueling.

The Containment Purge System includes two subsystems. The Shutdown Purge subsystem includes a 36 inch supply penetration and a 36 inch exhaust penetration. The second subsystem, a minipurge system, includes an 18 inch supply penetration and an 18 inch exhaust penetration. During MODES 1, 2, 3, and 4, the two valves in each of the Shutdown Purge supply and exhaust penetrations are secured in the closed position or blind flanged. The two valves in each of the two minipurge penetrations can be opened intermittently, but are closed automatically by the Engineered Safety Features Actuation System (ESFAS). Neither of the subsystems is subject to a Specification in MODE 5 or MODE 6 excluding CORE ALTERATIONS or movement of irradiated fuel in containment.

In MODE 6, large air exchanges are necessary to conduct refueling operations. The Shutdown purge system is used for this purpose, and all four valves are capable of being closed by the ESFAS in accordance with LCO 3.3.6, "Containment Purge Isolation Instrumentation," during CORE ALTERATIONS or movement of irradiated fuel in containment.

Typically the minipurge system is not used in MODE 6.

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated on at least one side. Isolation may be achieved by an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods must be approved and may include use of a material that can provide a temporary, atmospheric pressure, ventilation barrier (such as a valve, flange, or penetration sealing mechanism) for the other containment penetrations during fuel movements.

"Direct access from the containment atmosphere" is defined as: The action of the containment atmosphere proceeding from containment to the outside atmosphere without deviation or interruption and having no impairing element.

(continued)

INSERT B (B 3.9.4)

under administrative controls.

BASES

APPLICABLE SAFETY ANALYSES

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 2). The fuel handling accident (in containment) analyzed in Reference 2 consists of dropping a single irradiated fuel assembly onto other irradiated fuel assemblies. The requirements of LCO 3.9.7, "Refueling Pool Water Level," and the minimum decay time of 100 hours prior to CORE ALTERATIONS ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are well within the guideline values specified in 10 CFR 100. Standard Review Plan, Section 15.7.4, Rev. 1 (Ref. 3), defines "well within" 10 CFR 100 to be 25% or less of the 10 CFR 100 values. The acceptance limits for offsite radiation exposure will be 25% of 10 CFR 100 values.

Containment penetrations satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO limits the consequences of a fuel handling accident in containment by limiting the potential escape paths for fission product radioactivity released within containment. The LCO requires any penetration providing direct access from the containment atmosphere to the outside atmosphere to be closed except for the OPERABLE containment purge penetrations ~~and the personnel air lock~~. **INSERT C (B 3.9.4)** For the OPERABLE containment purge penetrations, this LCO ensures that these penetrations are isolable by the Containment Purge Isolation System to ensure that releases through the valves are terminated, such that radiological doses are within the acceptance limit. **INSERT D (B 3.9.4)** For the containment personnel air lock, one air lock door must be capable of being closed. **Thus b**~~B~~oth ~~containment~~ personnel air lock doors may be open during ~~movement~~ of irradiated fuel **assemblies** ~~within~~ **containment** or CORE ~~ALT~~ERATIONS, ~~provided an~~ air lock door **for each air lock** is capable of ~~being closed~~. Administrative controls ensure that 1) appropriate personnel are aware that both personnel air lock doors are open, 2) a specified individual(s) is designated and available to close the air lock **(s)** following a required evacuation of containment, and 3) any obstruction(s) (e.g. cables and hoses) that could prevent closure of an open air lock can be quickly removed (Ref. 1).

INSERT E (B 3.9.4)

INSERT F (B 3.9.4)

The LCO is modified by a NOTE allowing -penetration flow paths with direct access from the containment atmosphere -to the outside atmosphere to be unisolated under administrative -controls. Administrative controls ensure that 1) appropriate -personnel are aware of the open status of the penetration flow path during -CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, and

(continued)

INSERT C (B 3.9.4)

and the personnel air lock, the emergency air lock, and the equipment hatch, which must be capable of being closed.

INSERT D (B 3.9.4)

During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment, Containment Purge Isolation valves are OPERABLE if they are capable of being closed by manual actuation.

INSERT E (B 3.9.4)

and emergency air lock

INSERT F (B 3.9.4)

The containment equipment hatch may be open during movement of irradiated fuel assemblies within containment or CORE ALTERATIONS provided the hatch is capable of being closed and the water level in the refueling pool is maintained **in accordance with FSAR Section 16.9.4 or TS 3.9.7. FSAR 16.9.4 requires that at least 23 feet of water is maintained over the top of the irradiated fuel assemblies within the reactor pressure vessel while in MODE 6 and during movement of control rods within the reactor pressure vessel. TS 3.9.7 requires the refueling pool water level to be maintained ≥ 23 feet above the top of the reactor vessel flange during the movement of irradiated fuel assemblies within containment.**

Administrative controls include 1) appropriate personnel are aware of the open status of the containment during movement of irradiated fuel assemblies within containment or CORE ALTERATIONS, 2) specified individuals are designated and readily available to close the **containment** equipment hatch following an evacuation that would occur in the event of a fuel handling accident, and 3) any obstructions (e.g., cables and hoses) that would prevent rapid closure of the **containment** equipment hatch can be quickly removed. Administrative controls also ensure that during CORE ALTERATIONS or during the movement of irradiated fuel assemblies within containment and when the containment equipment hatch is open, the Containment Purge and Exhaust System is in service; the trip setpoint function for the purge radiation monitor detectors GTRE0022 and GTRE0033 is bypassed; and the requirements of TS LCO 3.3.7, CREVS Actuation Instrumentation, are met as directed by Table 3.3.7-1.

INSERT F (B 3.9.4) continued

To support the accident analyses and dose consequences for the postulated fuel handling accident (FHA) inside containment and to isolate containment, closure of the containment equipment hatch is required in the event of the postulated FHA inside containment. Closure is defined as the containment equipment hatch installed with four bolts.

Off-Normal plant procedures dictate the Control Room response to a Fuel Handling Accident and direct the operators to manually initiate a Control Room Ventilation Isolation. The Containment Purge and Exhaust System is not secured until the containment equipment hatch, the emergency airlock, and the personnel airlock are closed. The following sequence of actions occur:

<u>If the Equipment Hatch is open at the time of the FHA inside containment:</u>

- Manually initiate CRVIS
- Close Containment Hatches in the following order:
    - Equipment Hatch
    - Emergency **Airlock**
    - Personnel **Airlock**
- Following closure of the Personnel **Airlock**, Manually Initiate CPIS

<u>If the Equipment Hatch is closed at the time of the FHA inside containment:</u>

- Manually initiate CRVIS
- Close Containment Hatches in the following order:
    - Emergency **Airlock**
    - Personnel **Airlock**
- Following closure of the **Personnel Airlock**, Manually Initiate CPIS

Continued **service** of the Containment Purge and Exhaust System during the time interval between the fuel handling accident in containment and closure of the **containment** equipment **hatch, the emergency airlock,** and **the personnel airlock** will not result in any decrease or increase of calculated radiological consequences determined by the Licensing Bases radiological consequences analyses. It ensures that all post-accident releases are monitored.

In addition, Section 3.8.2.1.1 of the FSAR states that the **containment equipment hatch missile shield (missile shield)** is provided to protect the **containment equipment hatch**.

INSERT F (B 3.9.4) continued

Normally, the **containment equipment hatch and the missile shield** are closed during core alterations or during movement of irradiated fuel inside containment. However, when the **containment equipment hatch** is open under administrative controls, the **missile shield** is not required to be closed.

When severe weather conditions are within the plant monitoring radius and for thunderstorms or tornadoes that are determined to be moving toward the plant, the **missile shield** is required to be closed for protection against weather generated missiles being propelled inside containment. Plant administrative controls require that the **containment equipment hatch** is installed (with four bolts) upon the arrival of threatening weather conditions that could generate missiles.

The administrative controls also require that the **missile shield** is positioned to provide adequate protection. The **containment equipment hatch** is closed from inside containment and the **missile shield** is closed from outside containment. The **containment equipment hatch and the missile shield** are not interlocked, so that closure sequence is not a factor. The **containment equipment hatch and the missile shield** closing may be sequenced at the same time.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1 (continued)

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. The Surveillance interval is selected to be commensurate with the normal duration of time to complete fuel handling operations. As such, this Surveillance ensures that a postulated fuel handling accident that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the outside atmosphere.

INSERT G (B 3.9.4)

SR 3.9.4.~~2~~ **3**

This Surveillance demonstrates that each containment purge isolation valve actuates to its isolation position on manual initiation ~~or on an actual or simulated high radiation signal~~. The 18 month Frequency maintains consistency with other similar ESFAS instrumentation and valve testing requirements. In LCO 3.3.6, the Containment Purge Isolation instrumentation requires a CHANNEL CHECK every 12 hours, an ACTUATION LOGIC TEST every 31 days on a STAGGERED TESTS BASIS, and a COT every 92 days to ensure the channel OPERABILITY during ~~refueling operations.~~ **MODES 1, 2, 3, and 4.** Every 18 months a TADOT and a CHANNEL CALIBRATION are performed. The system actuation response time is demonstrated every 18 months on a STAGGERED TEST BASIS. SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These Surveillances will ensure that the valves are capable of ~~closing~~ **being manually closed** after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

REFERENCES

1. Amendment 114 to Facility Operating License No. NPF-30, Callaway Unit 1, dated July 15, 1996.
2. FSAR, Section 15.7.4.
3. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.
4. Amendment 138 to Facility Operating License No. NPF-30, Callaway Unit 1, dated September 26, 2000.

INSERT G (B 3.9.4)

SR 3.9.4.2

This Surveillance demonstrates that the necessary hardware, tools, and equipment are available to install the equipment hatch. The equipment hatch is provided with a set of hardware, tools, and equipment for moving the hatch from its storage location and installing it in the opening. The required set of hardware, tools, and equipment shall be inspected to ensure that they can perform the required functions.

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of irradiated fuel assemblies within the containment. The Surveillance interval is selected to be commensurate with the normal duration of the time to complete the fuel handling operations. The Surveillance is modified by a Note that only requires that the Surveillance be met for an open equipment hatch. If the equipment hatch is installed in its opening, the availability of the means to install the hatch is not required. The 7 day Frequency is adequate considering that the hardware, tools, and equipment are dedicated to the equipment hatch and not used for any other function.

ULNRC- 04674

ATTACHMENT 6

PROPOSED FSAR CHANGES

(for information only)

TABLE 11.5-3

AIRBORNE PROCESS RADIOACTIVITY MONITORS,

Monitor	Type (continuous)	Range (µCi/cc)	MDC (1) (µCi/cc)	Controlling Isotope	Alert (16) Alarm (µCi/cc)	Hi (16) Alarm (µCi/cc)	Total Ventilation Flow (cfm)	Minimum Required Sensitivity (µCi/cc)	Monitor Control Function
0-GT-RE-31 0-GT-RE-32 Containment atmosphere monitors	Particulate (3) Iodine (4) Gaseous (3)	10^{-12} to 10^{-7} 10^{-11} to 10^{-6} 10^{-7} to 10^{-2}	1×10^{-11} 1×10^{-10} 2×10^{-7}	Cs-137 I-131 Xe-133	1.0×10^{-8} 1.0×10^{-8} 3.0×10^{-4}	1.0×10^{-7} 9.0×10^{-7} 6.0×10^{-4}	420,000 420,000 420,000	1×10^{-7} (7) 9×10^{-8} (7) 1×10^{-4} (7)	NA
0-GT-RE-22 0-GT-RE-33 Containment purge system monitors	Particulate (3) Iodine (4) Gaseous (3)	10^{-12} to 10^{-7} 10^{-11} to 10^{-6} 10^{-7} to 10^{-2}	1×10^{-11} 1×10^{-10} 2×10^{-7}	Cs-137 I-131 Xe-133	5.0×10^{-8} 5.0×10^{-8} (12)	1.0×10^{-7} 9.0×10^{-8} (11) (15)	20,000/4000 20,000/4000 20,000/4000	1×10^{-7} (7) 9×10^{-8} (7) 1×10^{-4} (7)	Isolates containment purge, deenergizes purge fans on high gaseous activity via the ESFAS (see Section 7.3)
O-GT-RE-59 O-GT-RE-60 Containment high activity monitors	Gamma (5)	1 to 10^{8} rads/hr	1 rad/hr	NA	1.6×10^{3} R/hr	1.6×10^{4} R/hr	NA	NA	NA
O-GE-RE-92 Condenser air discharge monitor	Gaseous (continuous) (3), (6)	10^{-7} to 10^{-2}	2×10^{-7}	Xe-133	2×10^{-6} (9)	2×10^{-5} (10)	25	NA	Closes blowdown isolation valve on Hi alarms

See CN #80-065

TABLE 11.5-3 (Sheet 2)

AIRBORNE PROCESS RADIOACTIVITY MONITORS

Monitor	Type (continuous)	Range (μCi/cc)	MDC (1) (μCi/cc)	Controlling Isotope	Alert (16) Alarm (μCi/cc)	Hi (16) Alarm (μCi/cc)	Total Ventilation Flow (cfm)	Minimum Required Sensitivity (μCi/cc)	Monitor Control Function
O-GG-RE-27 O-GG-RE-28 Fuel building exhaust monitors (2)	Particulate (3) Iodine (4) Gaseous (3)	10^{-12} to 10^{-7} 10^{-11} to 10^{-6} 10^{-7} to 10^{-2}	1×10^{-11} 1×10^{-10} 2×10^{-7}	Cs-137 I-131 Xe-133	1×10^{-8} (8) 9×10^{-9} (8) 1.6×10^{-3}	1×10^{-7} (7) 9×10^{-8} (7) 3.2×10^{-3} (14)	20,000 20,000 20,000	1×10^{-7} (7) 9×10^{-8} (7) 1×10^{-4} (7)	Initiates switch to fuel building emergency ventilation on high gaseous activity via the ESFAS (see Section 7.3)
O-GK-RE-04 O-GK-RE-05 Control room air supply monitors	Particulate (3) Iodine (4) Gaseous (3)	10^{-12} to 10^{-7} 10^{-11} to 10^{-6} 10^{-7} to 10^{-2}	1×10^{-11} 1×10^{-10} 2×10^{-7}	Cs-137 I-131 Xe-133	1×10^{-8} (8) 9×10^{-9} (8) 1.1×10^{-3}	1×10^{-7} (7) 9×10^{-8} (7) 2.2×10^{-3} (13)	2000 2000 2000	1×10^{-7} (7) 9×10^{-8} (7) 1×10^{-4} (7)	Initiates switch to control room emergency ventilation on high gaseous activity via the ESFAS (see Section 7.3)

Sample flow for each channel is 3 cfm

(1) MDC = minimum detectable concentration.
(2) When fuel is in the building.
(3) Beta scintillation detector.
(4) Gamma scintillation detector.
(5) Gamma sensitive ion chamber.
(6) When in operation.
(7) 10 MPC.
(8) MPC
(9) One order of magnitude above MDC to avoid spurious alarms and to indicate primary to secondary leakage.
(10) Two orders of magnitude above MDC to indicate significant inleakage of radioactivity.
(11) High alarm is set to ensure that Offsite Dose Calculation Manual limits are not exceeded.
(12) Alert alarm is administratively established at a point sufficiently below the High alarm so as to provide additional assurance that Offsite Dose Calculation Manual limits are not exceeded.
(13) Submersion dose rate does not exceed 2 mr/hr in the control room.
(14) Submersion dose rate does not exceed 4 mr/hr in the fuel building.
(15) High alarm setpoint is established to ensure that Offsite Dose Calculation Manual limits are not exceeded ~~and is limited to 5×10^{-3} μci/cc during core alterations of movement of irradiated fuel within the containment.~~
(16) Alert and High alarm values do not include instrument loop uncertainty estimates.

FSAR CN 01-030

See CN#99-047

TABLE 12.3-3 Table 12.3-3

INPLANT AIRBORNE RADIOACTIVITY MONITORS

Monitor	Type (continuous)	Range µCi/cc	MDC(1) µCi/cc	Controlling Isotope	Alert (15) Alarm µCi/cc	
OGTRE31	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	1×10^{-8}	
OGTRE32	Iodine (4)	10^{-11} to 10^{-6}	1×10^{-10}	I131	1.0×10^{-8}	
Containment atmosphere monitors	Gaseous (3)	10^{-7} to 10^{-2}	2×10^{-7}	Xe-133	3.0×10^{-4}	
OGTRE22	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	5×10^{-8}	
OGTRE33	Iodine (4)	10^{-11} to 10^{-6}	1×10^{-10}	I131	5×10^{-8}	
Containment purge system monitors	Gaseous (3)	10^{-7} to 10^{-2}	2×10^{-7}	Xe-133	(10)	
OGGRE27	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	1×10^{-8}	
OGGRE28	Iodine (4)	10^{-11} to 10^{-6}	1×10^{-10}	I131	9×10^{-9}	
Fuel building exhaust monitors (2)	Gaseous (3)	10^{-7} to 10^{-2}	2×10^{-7}	Xe-133	1.6×10^{-3}	
OGKRE04	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	1×10^{-8}	
OGKRE05	Iodine (4)	10^{-11} to 10^{-6}	1×10^{-10}	I131	9×10^{-9}	
Control room air supply monitors	Gaseous (3)	10^{-7} to 10^{-2}	2×10^{-7}	Xe-133	1.1×10^{-3}	
OGLRE60 Auxiliary Building ventilation exhaust monitor	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	1×10^{-8}	
OGKRE41 Access control area ventilation exhaust monitor	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	1×10^{-9}	(8)
OGHRE23 Waste gas decay tank area ventilation exhaust monitor	Gaseous (3)	10^{-7} to 10^{-2}	2×10^{-7}	Kr85 Xe-133	1×10^{-5}	(8)
Portable monitor	Particulate (3)	10^{-12} to 10^{-7}	1×10^{-11}	Cs137	NA	
	Iodine (4)	10^{-11} to 10^{-6}	1×10^{-10}	I131	NA	
	Gaseous (3)	10^{-7} to 10^{-2}	2×10^{-7}	Kr85	NA	

TABLE 12.3-3 (Sheet 2)

INPLANT AIRBORNE RADIOACTIVITY MONITORS

High (15) Alarm µCi/cc	Flow Ventilation Flow (cfm)	Subcompartment Flow Rate (cfm)	Dilution Factor	Minimum Required Sensitivity (µCi/cc)	Monitor Control Function
1×10^{-7}	420,000	NA	NA	1×10^{-7} (6)	NA
9×10^{-7}	420,000	NA	NA	9×10^{-8} (6)	
6.0×10^{-4}	420,000	NA	NA	1×10^{-4} (6)	
1×10^{-7}	20,000/4,000	NA	NA	1×10^{-7} (6)	See Table 11.5-3 for process and control functions.
9×10^{-8}	20,000/4,000	NA	NA	9×10^{-8} (6)	
(11)	20,000/4,000	NA	NA	1×10^{-4} (6)	
(14)					
1×10^{-7}	20,000	NA	NA	1×10^{-7} (6)	See Table 11.5-3 for process control functions.
9×10^{-8}	20,000	NA	NA	9×10^{-8} (6)	
3.2×10^{-3} (13)	20,000	NA	NA	1×10^{-4} (6)	
1×10^{-7}	2000	NA	NA	1×10^{-7} (6)	See Table 11.5-3 for process control functions.
9×10^{-8}	2000	NA	NA	9×10^{-8} (6)	
2.2×10^{-3} (12)	2000	NA	NA	1×10^{-4} (6)	
1×10^{-7}	12,000	100	8×10^{-3} (5)	8×10^{-10} (6),(9)	Alarms
1×10^{-8} (7)	6,000	100	1.67×10^{-2} (5)	1.67×10^{-9} (6),(9)	Alarms
1×10^{-4} (7)	500	250	0.5 (5)	5×10^{-5} (6),(9)	Alarms
NA	NA	NA	NA		Alarms
NA	NA	NA	NA		
NA	NA	NA	NA		

TABLE 12.3-3 (Sheet 3)

INPLANT AIRBORNE RADIOACTIVITY MONITORS (CALLAWAY)

Sample Flow for each channel is 3 cfm.

(1) MDC = minimum detectable concentration.

(2) When fuel is in the building.

(3) Beta scintillation detector.

(4) Gamma scintillation detector.

(5) Dilution factor = $\frac{\text{Subcompartmental flow in cfm}}{\text{Total flow in cfm}}$

(6) Minimum required sensitivity of monitor in µCi/cc at 10 MPChrs for the controlling isotope = dilution factor x 10 MPC.

(7) 10 MPC x dilution factor.

(8) MPC x dilution factor.

(9) Grab samples will be analyzed in the laboratory, and iodine concentrations will be calculated, using previously established ratios.

(10) Alert alarm is administratively established at a point sufficiently below the High alarm so as to provide additional assurance that Offsite Dose Calculation Manual (ODCM) limits are not exceeded.

(11) High alarm is set to ensure that ODCM limits are not exceeded.

(12) Submersion dose rate does not exceed 2 mr/hr in the control room.

(13) Submersion dose rate does not exceed 4 mr/hr in the fuel building.

(14) High alarm setpoint is established to ensure that ODCM limits are not exceeded and is limited to 5×10^{-3} µCi/cc during core alterations or movement of irradiated fuel within the containment.

FSAR CN 01-030

(15) Alert and High alarm setpoint values do not include instrument loop uncertainty estimates.

TABLE 16.3-2 (Continued)
ENGINEERED SAFETY FEATURES RESPONSE TIMES(11)

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
9. Steam Generator Water Level-Low-Low	
a. Start Motor-Driven Auxiliary Feedwater Pumps	≤ 60(8)
b. Start Turbine-Driven Auxiliary Feedwater Pump	≤ 60(8)
c. Feedwater Isolation	≤ 2(5),(8)
10. Loss-of-Offsite Power	
Start Turbine-Driven Auxiliary Feedwater Pump	≤ 60(9)
11. Trip of All Main Feedwater Pumps	
Start Motor-Driven Auxiliary Feedwater Pumps	N.A.
12. Auxiliary Feedwater Pump Suction Pressure-Low	
Transfer to Essential Service Water	≤ 60(1)
13. RWST Level-Low-Low Coincident with Safety Injection	
Automatic Switchover to Containment Sump	≤ 40(10)
14. Loss of Power	
a. 4 kV Bus Undervoltage-Loss of Voltage	≤ 14(6)
b. 4 kV Bus Undervoltage-Grid Degraded Voltage	≤ 144(13)
15. Phase "A" Isolation	
a. Control Room Isolation	N.A.
b. Containment Purge Isolation	≤ 2(5)
16. Control Room High Gaseous Activity	
Control Room Isolation	≤ 60(14)

FSAR CN
01-030

TABLE 16.3-2 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

TABLE NOTATIONS

(11) NRC approved the use of allocated response times for some components in their letter from Jack Donohew to Garry L. Randolph, "Application of WCAP-14036-P-A for Response Time Testing Elimination at Callaway Plant, Unit 1 (TAC NO. MA7283)," dated March 3, 2000.

(12) Signal actuation and valve stroke time delays included.

(13) Signal actuation, diesel generator starting, loss of voltage time delay relay, LSELS degraded voltage bistable delay timers and degraded voltage feeder breaker time delay relays included.

Insert 4a

FSAR CN 01-030

FSAR CN
01-030

INSERT 4a

(14) The radiation monitor detector is excluded from response time testing. The stated response time accounts for the elapsed time between introduction of a count rate from the detector corresponding to the actuation setpoint and repositioning of the components necessary to achieve Control Room isolation.

16.11.2.4 RADIOACTIVE GASEOUS EFFLUENT MONITORING
(3/4.3.3.10) INSTRUMENTATION LIMITING CONDITION FOR OPERATION

(ODCM 9.2.1)

The radioactive gaseous effluent monitoring instrumentation channels shown in Table 16.11-5 shall be OPERABLE with their Alarm/Trip Setpoints set to ensure that the limits of Section 16.11.2.1 are not exceeded. The Alarm/Trip Setpoints of these channels meeting Section 16.11.2.1 shall be determined and adjusted in accordance with the methodology and parameters in the ODCM.

APPLICABILITY: As shown in Table 16.11-5.

ACTION:

a. With a radioactive gaseous effluent monitoring instrumentation channel Alarm/Trip Setpoint less conservative than required by the above, immediately suspend the release of radioactive gaseous effluents monitored by the affected channel, or declare the channel inoperable.

b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 16.11-5. Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION, or explain in the next Radioactive Effluent Release Report, pursuant to Technical Specification 5.6.3, why this inoperability was not corrected within the time specified.

c. The provisions of Sections 16.0.1.3 and 16.0.1.4 are not applicable.

16.11.2.4.1 SURVEILLANCE REQUIREMENTS

(ODCM 9.2.2)

a. Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and CHANNEL OPERATIONAL TEST at the frequencies shown in Table 16.11-6.

FSAR CN 01-030

b. Verify the trip setpoint/concentration value for Containment Purge Monitors (GT-RE-22 and GT-RE-33) is set at less than or equal to 5E-3μCi/cc during CORE ALTERATIONS or movement of irradiated fuel within the containment.

16.11.2.4.2 BASES

The radioactive gaseous effluent monitoring instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases of gaseous effluents. The Alarm/Trip Setpoints for these instruments shall be calculated and adjusted in accordance with the methodology and parameters in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General

Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50. The sensitivity of any noble gas activity monitor used to show compliance with the gaseous effluent release requirements of Section 16.11.2.1 shall be such that concentrations as low as 1 x 10^{-6} µCi/cc are measurable.

The restriction on the setpoint for GT-RE-22 and GT-RE-33 is based on a fuel handling accident inside the Containment Building with resulting damage to one fuel rod and subsequent release of 0.1% of the noble gas rod activity, except for 0.3% of the Kr-85 activity. The setpoint concentration of 5E-3µCi/cc is is equivalent to approximately 150 mR/hr submersion dose rate.

FSAR CN
01-030

TABLE 16.11-5

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

FSAR CN 01-030

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. Unit Vent System			
a. Noble Gas Activity Monitor - Providing Alarm (GT-RE-21)	1	At all times	40,46
b. Iodine Sampler	1	At all times	43
c. Particulate Sampler	1	At all times	43
d. Unit Vent Flow Rate	1	At all times	45
e. Particulate and Radioiodine Sampler Flow Rate Monitor	1	At all times	43
2. Containment Purge System			
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release (GT-RE-22, GT-RE-33)	2	MODES 1,2,3,4 and (alarm functions only) during CORE ALTERATIONS or movement of irradiated fuel within the containment	41
b. Iodine Sampler	1	MODES 1,2,3,4 and during CORE ALTERATIONS or movement of irradiated fuel within the containment	43
c. Particulate Sampler	1	MODES 1,2,3,4 and during CORE ALTERATIONS or movement of irradiated fuel within the containment	43
d. Containment Purge Ventilation Flow Rate	N/A	N/A	N/A
e. Particulate and Radioiodine Sampler Flow Rate Monitor	1	MODES 1,2,3,4 and during CORE ALTERATIONS or movement of irradiated fuel within the containment	43
3. Radwaste Building Vent System			
a. Noble Gas Activity Monitor-Providing Alarm and Automatic Termination of Release (GH-RE-10)	1	At all times	38,40

ULNRC- 04674

ATTACHMENT 7

SUMMARY OF REGULATORY COMMITMENTS

SUMMARY OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by AmerenUE, Callaway Plant in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Dave E. Shafer, Superintendent, Licensing at AmerenUE, Callaway Plant, (314) 554-3104.

COMMITMENT	Due Date/Event
The amendment for allowing the containment equipment hatch and the emergency airlock to be open during CORE ALTERATIONS and/or during movement of irradiated fuel assemblies will be implemented prior to Refueling Outage 12.	Prior to MODE 6 of Refueling Outage 12
Administrative controls consisting of written procedures will be established prior to the implementation of the proposed change. These procedural controls would require: 1) appropriate personnel are aware of the open status of the containment during movement of irradiated fuel assemblies within containment or CORE ALTERATIONS, 2) specified individuals are designated and readily available to close the containment equipment hatch and emergency airlock following an evacuation that would occur in the event of a fuel handling accident, and 3) any obstructions (e.g., cables and hoses) that would prevent rapid closure of an open equipment hatch or emergency airlock can be quickly removed.	Prior to MODE 6 of Refueling Outage 12
Identified TS Bases and Callaway FSAR changes will be incorporated into the TS Bases and the Callaway FSAR during implementation of the amendment.	During implementation of the amendment
Administrative controls consisting of written procedures will be established to ensure that during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment and when the containment equipment hatch is open, either the minipurge or the shutdown purge exhaust system is in service; the trip setpoint function for the purge radiation monitor detectors GTRE0022 and GTRE0033 is bypassed; and the requirements of TS LCO 3.3.7, CREVS Actuation Instrumentation, are met as directed by Table 3.3.7-1..	Prior to MODE 6 of Refueling Outage 12

ULNRC- 04674

ATTACHMENT 8

NRC QUESTIONS AND AMERENUE RESPONSES

CALLAWAY EQUIPMENT HATCH AMENDMENT REQUEST
NRC QUESTIONS AND AMERENUE RESPONSES

Question 1

Discuss the benefits expected during refueling outages from the license amendment request (LAR) to have the equipment hatch and emergency air lock open during refueling while there is core alterations or irradiated fuel movement inside containment.

Response

The benefits of the proposed amendment are briefly discussed in the submittal letter and within the Introduction and Description sections of the submittal Evaluation (Attachment 2). The amendment would allow refueling activities to continue while the containment equipment hatch and the emergency air lock are open and available for unrestricted access of personnel and large equipment. AmerenUE anticipates flexibility in scheduling outage activities with the result of reduced outage time and costs. For example, without the proposed amendment the movement of equipment necessary for repairs or to support other outage activities would be delayed until core off load is completed. AmerenUE will be replacing steam generators in a future outage and the use of the equipment hatch will facilitate movement of equipment and personnel into and out of containment and will reduce critical path time to stage equipment in containment.

Question 2

It is requested that the licensee agree to add the proposed changes to the TS Bases and FSAR provided as attachments to the application of December 6, 2001, to these documents during the implementation of the amendment.

Response

The proposed changes to the TS Bases (Attachment 5) and FSAR (Attachment 6) are provided with the submittal package for "information only". Based on the approved amendment and after the changes are processed via the Callaway FSAR and TS Bases update programs, Callaway will add the identified TS Bases and FSAR changes to the TS Bases and FSAR during implementation of the amendment.

Question 3

Discuss if the minimum time for moving irradiated fuel in the core during the refueling outage would be changed by the LAR.

Response

The proposed amendment request would not impact the minimum time for moving irradiated fuel in the core during refueling. Plant procedures for moving irradiated fuel in the core during refueling would not be revised based on the proposed amendment. During a refueling outage, other work inside containment continues during fuel movement and CORE ALTERATIONS. The movement of equipment and personnel through the containment equipment hatch and the emergency air lock would facilitate the work. The amendment request would facilitate continuing other allowed refueling activities within containment because the containment equipment hatch and the emergency air lock would be open under administrative controls.

Question 4

It is stated on the bottom paragraph of page 11 of 16 in Attachment 2 that "The typical time frame to close the open equipment hatch is less than one hour." Does this "less than one hour" include the installation of four bolts in the hatch? Provide the basis for the time to close the open equipment hatch. Discuss also what would be the time to close the emergency air lock and the basis for the time.

Response

As discussed in the referenced paragraph, Callaway anticipates a typical closure time of less than one hour. This time is sufficient for plant personnel to install the containment equipment hatch with four bolts, isolating containment. The closure time is based on plant past experience and on discussions with outage containment coordinators.

As discussed in FSAR Section 3.8.2.1.1, the emergency air lock is enclosed within an exterior tornado-resistant concrete structure. The emergency air lock does not open directly to the environment and may be secured in less than 30 minutes following the containment equipment hatch being placed in the closed position. This closure time is based on plant past experience and on discussions with outage containment coordinators.

Timing measurements for closing the containment equipment hatch and the emergency airlock were not performed. As stated, the identified time frames are based on past experiences in performing the activities. In summary, the containment equipment hatch can be closed (installed with four bolts) in less than one hour. The emergency air lock can be closed in less than 30 minutes following the containment equipment hatch being placed in the closed position.

Callaway's experience for closure times is consistent with the experience of the other STARS plants making this amendment request.

Question 5

Discuss what provides tornado missile protection through the equipment hatch for the inside of containment during refueling outages. This is protection of the equipment inside containment which is needed to maintain the reactor safely shutdown in the outage.

Response

The Callaway FSAR Section 9.1.4 indicates that the fuel handling system, in accordance with GDC-2, is protected from the effects of external events, including tornadoes and the missiles generated from the tornado. FSAR Section 3.5.1.4 discusses missiles generated by natural phenomena. FSAR Section 3.5.2 discusses the systems which are to be protected and states, in part: "All safety-related systems and components to be protected from tornado missiles are enclosed within protective structures which meet the requirements of Regulatory Guide 1.117. Openings to these structures are designed to prevent the entry of the design basis missile when the result would preclude the safety functions of the enclosed system or components. Prevention of missile entry includes the use of missile doors and barriers at openings and adjacent buildings as shields in penetration areas. Missile barriers are designed utilizing the procedures given in Section 3.5.3." FSAR Section 3.8.2.1.1 states that "A moveable missile shield is provided on the outside of the reactor building to protect the equipment hatch." As stated on page 12 of 16 of the submittal, under severe weather conditions, administrative controls are provided with the intent that the containment equipment hatch be installed (with four bolts) upon the arrival of threatening weather conditions that could generate missiles and the missile shield is positioned to provide adequate protection.

Question 6

Discuss the plant procedures dealing with severe weather and the stages of severe weather watches and warnings whereby action will be taken during refueling outages in response to the severe weather with respect to (1) fuel handling operations inside containment and (2) missile protection through the equipment hatch for inside containment.

Response

As stated on page 12 of 16 in the submittal, plant procedures are written with the intent that the containment equipment hatch be installed upon the arrival of threatening weather conditions that could generate missiles. Under severe weather conditions, the containment equipment hatch door is installed and the missile shield is positioned to provide adequate protection.

Callaway Procedure EIP-ZZ-00231, RESPONSE TO SEVERE THUNDERSTORM/HIGH WINDS/TORNADO WATCHES AND WARNINGS,
provides the method for responding to severe thunderstorm watches, thunderstorm warnings, high winds, tornado watches, or tornado warnings. Included in the procedure are notifications of severe weather to plant workers; emergency actions to be taken for severe weather; and procedures to control opening and closing of specified missile shields. The following summary provides definitions used in the procedure:

- Severe Thunderstorm – A thunderstorm which produces tornadoes, hail 0.75 inches or more in diameter, or winds of 58 mph or more.
- Watch – A National Weather Service product indicating that a particular hazard is possible, i.e., that conditions are more favorable than usual for its occurrence. A watch is a recommendation for planning, preparation, and increased awareness.

- Tornado Watch – Identifies an area where conditions are favorable for a tornado formation.
- Warning – Issued by the National Weather Service local offices indicating that a particular weather hazard is either imminent or has been reported. A warning indicates the need to take action to protect life and property. The type of hazard is reflected in the type of warning (e.g., tornado warning, blizzard warning).
- Tornado Warning – A tornado warning means that a tornado has been sighted or indicated by weather radar.

The National Oceanic and Atmospheric Administration (NOAA) is an organization of the U.S. Commerce Department and keeps a round-the-clock vigil on atmospheric conditions and issues watches and warnings for severe atmospheric conditions. A weather radio, which can receive NOAA weather announcements, is located in the Control Room, in the Shift Supervisor's office, and is activated when local severe weather conditions exist. When severe weather conditions exist and when in MODE 6, weather monitoring for the containment equipment hatch missile shield is maintained for a distance of 140 miles around the plant. For thunderstorm and tornado warnings, all activities associated with fuel handling and processing of radioactive materials are stopped as soon as practical, but before the storm reaches the plant. As provided in Attachment 4 to the procedure, approximately two hours closure time is needed to close the missile shield protecting the containment equipment hatch.

During refueling operations with the containment equipment hatch missile shield open, weather monitoring is required. The Callaway procedure, EIP-ZZ-00231, is implemented on severe weather watch. The procedure requires that an assessment of current and future weather conditions (over a 48-hour period) is performed prior to removing the containment equipment hatch missile shield. This assessment includes the 140-mile monitoring radius around the plant.

The monitoring radius of 140 miles is based on a tornado translational speed of 70-mph (FSAR Site Addendum 2.3.1.2.6.2) and a time of 2 hours to close the containment equipment hatch missile shield. The two-hour closure time for the missile shield is the maximum time available from the time a tornado or thunderstorm is identified at the 140-mile perimeter. However, the best estimate for actual closure time is within one hour. This allows sufficient time to close the containment equipment hatch. The containment equipment hatch is closed from inside containment and the missile shield is closed from the outside of containment. Because the containment equipment hatch and the missile shield are not interlocked, their closing sequence may be simultaneous.

If the missile shield is open, and a thunderstorm or tornado is discovered at the perimeter, or within the monitoring distance, a determination is made as to whether the storm is moving toward the plant. If the thunderstorm or tornado is at the perimeter or within the monitoring distance and is moving toward the plant, then actions are taken to immediately close the containment equipment hatch missile shield.

If the thunderstorm or tornado is at the perimeter or within the monitoring distance, but is not moving toward the plant, then the missile shield may remain open as long as the weather monitoring continues to ensure the thunderstorm or tornado is not moving toward the plant.

The weather monitoring and forecasting are provided on an hourly basis. Although weather-monitoring updates are supplied on an hourly basis, any severe weather that would enter the 140-mile monitoring radius would be immediately announced to the plant. At that point, if the storm is moving toward the plant, closure of the missile shield is initiated.

Question 7

In Section 3.0, "Background, of Attachment 2, it is stated that "During shutdown conditions, administrative controls ensure that an appropriate missile barrier is in place during the threat of severe weather…" Discuss the "appropriate" missile barrier referred to in the previous sentence, including describing the barrier, what it will protect, when will it be put in place with respect to severe weather, and the time to put the barrier in place.

Response

As provided in the response to Questions 5 and 6, the missile shield for the containment equipment hatch protects safety systems inside containment from external missile damage. Plant procedures require that the missile shield be in place before a storm, which has the potential of generating missiles, reaches the plant. Plant procedures allow an estimated two-hour closure time for putting the missile shield in place.

Section 3.8.2.1.1 of the FSAR states that the containment equipment hatch missile shield is provided to protect the containment equipment hatch. Normally, the containment equipment hatch and the missile shield are closed during core alterations or during movement of irradiated fuel inside containment. However, under the proposed license amendment, when the containment equipment hatch is open under administrative controls, then the missile shield is not required to be closed.

To support the accident analyses and dose consequences for the postulated fuel handling accident (FHA) inside containment and to isolate containment, closure of the containment equipment hatch is required in the event of the postulated FHA inside containment. Closure is defined as the containment equipment hatch installed with four bolts. In the event of severe weather conditions within the plant monitoring radius and for thunderstorms or tornadoes that are determined to be moving toward the plant, the containment equipment hatch missile shield is required to be closed for protection against weather generated missiles being propelled inside containment.

Closure Based on Severe Weather Conditions

Plant administrative controls require that the containment equipment hatch is installed (with four bolts) upon the arrival of threatening weather conditions that could generate missiles. The administrative controls also require that the missile shield is positioned to provide adequate protection. As discussed in the response to Question 6, the missile shield is closed if a thunderstorm or tornado is monitored within a 140-mile radius of the plant and is determined to be moving toward the plant. The maximum closure time for the missile shield alone is two hours. The best estimate for actual closure is within one hour.

Plant administrative controls also ensure that the containment equipment hatch is installed prior to the arrival of severe weather conditions at the plant. The time to close the containment equipment hatch alone is expected to be less than an hour.

The containment equipment hatch and the containment equipment hatch missile shield are not interlocked, so that closure sequence is not a factor. The equipment hatch door and the missile shield closing may be sequenced at the same time.

Closure Based on Postulated FHA Inside Containment

In the event of a postulated FHA inside containment and to isolate containment, administrative controls ensure that the containment equipment hatch is installed with four bolts. The time to close the containment equipment hatch alone is expected to be less than an hour. In the absence of severe weather conditions, the containment equipment hatch missile shield may remain open.

Question 8

Discuss why current SR 3.9.4.2 needs to be revised to replace the phrase "actual or simulated actuation signal" in the SR by "manual actuation signal." It would seem that a "manual actuation signal" would also be an "actual actuation signal" so that SR 3.9.4.2 does not need to be revised to allow the use of a manual actuation signal to verify each containment purge isolation valve actuates to the isolation position.

Response

Callaway Plant usage assumes an “automatic signal” when a TS Surveillance uses the phrase “on an actual or simulated actuation signal” since a manual signal is not “simulated”. The proposed revision clarifies that a strictly “manual actuation” is required for containment isolation. The “automatic signal” for containment purge isolation, referenced here, is being deleted from the TS during plant conditions involving CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. The containment purge isolation trip setpoint will be bypassed during these plant conditions. During CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment, the containment purge exhaust radiation channels will only cause an alarm in the control room upon exceeding limits for high purge exhaust radiation.

Question 9

Related to the proposed change to Condition C of TS 3.3.6, there is the following phrase at the beginning of the third paragraph on page 3 of 16 of Attachment 2: "As a result of the change to the LCO." Is the LCO being referred to LCO 3.9.4 or Table 3.3.6-1 (i.e., is the reference to the proposed deletion of footnotes (a) and (b) for the automatic actuation logic and relays function and the containment purge exhaust radiation gaseous function of the table)?

Response

The LCO being referred to here is LCO 3.3.6, not LCO 3.9.4. In the third paragraph of the submittal on page 3 of 16 of Attachment 2, the reference to "LCO" pertains to the Applicability changes in Table 3.3.6-1 and the proposed deletion of footnotes (a) and (b) from the "Automatic Actuation Logic and Actuation Relays (BOP ESFAS)" Function and the "Containment Purge Exhaust Radiation-Gaseous" Function. Because the automatic actuation signal for containment purge isolation, based on the containment purge exhaust radiation channels, is being deleted from the TS in these plant conditions, Functions 2 and 3 of Table 3.3.6-1 are no longer applicable during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. However, the containment purge exhaust radiation channels will continue to monitor the purge effluent and will alarm the control room on high purge exhaust radiation. As indicated in Table 3.3.6-1 (Function 1), manual initiation of containment purge isolation remains applicable for plant conditions involving CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.

Question 10

Discuss why footnotes (a) and (b) for applicable modes are proposed to be deleted for the containment purge exhaust radiation gaseous function in TS Table 3.3.6-1. Deleting the footnotes from the automatic actuation logic and relays function of the table would eliminate the requirement for automatic CPIS isolation during core alterations or movement of irradiated fuel inside containment in refueling outages. Deleting the footnotes for the containment purge exhaust radiation gaseous function of the table would appear to delete the requirement to have the gaseous radiation monitor operable and operating during core alterations or movement of irradiated fuel inside containment, and the application appears to require monitoring of the radioactivity released through the containment purge exhaust by these monitors.

Response

TS 3.3.6, "Containment Purge Isolation Instrumentation" is revised to reflect the proposed CPIS trip setpoint bypass during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. As indicated in Table 3.3.6-1 (Function 1, footnotes (a) and (b)), manual initiation of containment purge isolation remains applicable during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.

As designed, the containment purge exhaust radiation channels (GTRE0022 and GTRE0033) provide automatic CPIS actuation on high purge exhaust gaseous radiation. Without the proposed bypass of this automatic isolation function, in the event of a fuel handling accident during CORE ALTERATIONS or during the movement of irradiated fuel assemblies within containment, and with an open containment equipment hatch, the Containment Purge and Exhaust System would isolate on the automatic CPIS. Therefore, the purge system would be unavailable to assure that a negative pressure is maintained in containment and assure that any radioactive release would be directed out of the monitored and filtered purge system exhaust via the unit vent (see FSAR Figure 9.4-6, sheet 4).

Instead, based on the proposed amendment, in the described postulated plant condition, the operating Containment Purge and Exhaust System will assure a negative pressure is maintained in containment until containment penetrations are administratively closed. In addition, the operating Containment Purge and Exhaust System will also assure that any radioactive release paths are directed to the unit vent, which assures the effluent is monitored and exhausted through a non-safety related filter/adsorber unit, until unisolated containment penetrations are closed.

As discussed in the response to Question 9, bypassing the automatic isolation signal from the containment purge exhaust radiation channels does not impact their monitoring function. The containment purge exhaust radiation channels will continue to alarm the control room on high purge exhaust radiation.

All automatic ventilation isolation instrumentation functions that are credited during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment will now be addressed in LCO 3.3.7. In order to clarify Table 3.3.7-1 Applicability, after the incorporation of new Function 5, revised markups are proposed for TS 3.3.7 and are provided as Attachment 1 to these Questions and Responses. The proposed revised markups replace entirely pages 3.3-63 and 3.3-64 of Attachment 3 to ULNRC-04574, dated December 6, 2001, and add page 3.3-62.

The proposed Technical Specification change will have no effect on the consequences of a Fuel Building Fuel Handling Accident (FBFHA). The proposed change will have no impact on the Licensing Bases radiological consequences analyses for the Reactor Building Fuel Handling Accident (RBFHA). The current Licensing Bases analyses for the RBFHA takes no credit for retention, holdup, or decay of radioactivity within the Reactor Building. All radioactivity that emerges from the surface of the refueling pool water is assumed to be released directly to the outside environment. The proposed Technical Specification change will not affect the magnitude of radiological consequences calculated in the Licensing Bases calculation of record.

During fuel handling operations, Technical Specifications require constant communications between the refueling machine and the Control Room. Control Room operators would be verbally notified of a fuel handling accident via this constant communication.

Additionally, depending on the magnitude of fuel damage caused by the postulated fuel handling accident, alarms would be received to alert the Control Room operator of elevated radiation levels inside the Reactor Building, and elevated radiation levels in the Control Room air intake.

Off-Normal Operations procedures dictate the Control Room response to a Fuel Handling Accident. These procedures would direct the operators to manually initiate a Control Room Ventilation Isolation. The Containment Purge and Exhaust System would not be secured until the containment equipment hatch, the emergency airlock, and the personnel airlock have been closed.

The following sequence of actions will be incorporated into Callaway's Off-Normal Operations procedures for the RBFHA sequence:

If the Equipment Hatch is open:

- Manually initiate CRVIS
- Close Containment Hatches in the following order:

  - Equipment Hatch
  - Emergency Airlock
  - Personnel Airlock

- Following closure of the Personnel Airlock, Manually Initiate CPIS

If the Equipment Hatch is closed at the time of the RBFHA, the following actions will be taken:

- Manually initiate CRVIS
- Close Containment Hatches in the following order:

  - Emergency Airlock
  - Personnel Airlock

- Following closure of the Emergency Airlock and the Personnel Airlock, Manually Initiate CPIS

Continued service of the Containment Purge and Exhaust System during the time interval between the RBFHA and closure of the containment equipment hatch, the emergency airlock, and the personnel airlock will not result in any decrease or increase of calculated radiological consequences determined by the Licensing Bases radiological consequences analyses. It will ensure that all post-accident releases are monitored.

Question 11

For the previous question, discuss if the deletion of footnotes (a) and (b) should apply only if the equipment hatch is open (i.e., footnotes (a) and (b) on the applicable modes for the containment purge exhaust radiation gaseous function and the automatic actuation logic and relays function of the table would be kept and revised by adding a phrase that states "unless the equipment hatch is open"). This would maintain the current requirements in TS 3.3.6-1 unless the equipment hatch was opened during core alterations or movement of irradiated fuel inside containment.

Response

The proposed change provides the preferred means for implementing the administrative controls for the open containment equipment hatch during CORE ALTERATIONS or during movement of irradiated fuel assemblies inside containment. Adding the statement "unless the equipment hatch is open" to footnotes in TS Table 3.3.6-1 would also add the administrative complication of requiring the automatic function for the containment purge isolation signal to be enabled or disabled based on whether the containment equipment hatch was open or closed. Because the potential consequences of a postulated fuel handling accident remain unaltered, this administrative complication is not warranted.

The current requirement for automatic containment purge isolation during fuel handling operation is an artifact of the assumptions regarding the consequences of a RBFHA when Technical Specifications required a modified Containment Integrity during fuel handling operations. When approval was received to handle fuel with the Personnel Hatch open, the Licensing Bases radiological consequences analyses for the RBFHA sequence was revised to take no credit for retention, holdup, or decay of radioactivity within the Reactor Building. However, the automatic containment purge isolation function was retained so that actual radioactivity releases would be reduced by isolating the Containment Purge and Exhaust System following a RBFHA.

Implementation of the proposed Technical Specification change now creates a direct opening between the Reactor Building atmosphere and the outside environment. GDC 64 requires that post-accident releases be monitored. Continued operation of the Containment Purge and Exhaust System during the time interval between the RBFHA and closure of the containment equipment hatch, the emergency airlock, and personnel airlock will maintain the Reactor Building at a negative pressure relative to the outside environment, and will ensure that post-accident releases are monitored as they are released via the Unit Vent.

Automatic protection of Control Room personnel will continue to be provided by GKRE0004 and GKRE0005 (radiation monitors for the Control Building outside air intake). These monitors will now be credited for Control Room isolation.

Question 12

Are the changes to TS Table 3.3.6-1 only to delete the requirement for automatic containment isolation of the containment purge exhaust system? The manual initiation of the containment purge exhaust system is the manual initiation function specified in TS Table 3.3.6-1 for core alterations or irradiated fuel movement inside containment, footnotes (a) and (b).

Response

The changes to TS Table 3.3.6-1 are made solely to delete the TS requirement for automatic isolation of the Containment Purge and Exhaust System during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. TS Table 3.3.6-1 (Function 1, footnotes (a) and (b)) require manual initiation for isolation of the Containment Purge and Exhaust System during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.

Question 13

Are the changes to TS Table 3.3.7-1 only to add a requirement for the automatic control room ventilation isolation actuation function and the control room intakes closure function in the table from the fuel building exhaust gaseous radiation monitor during core alterations or movement of irradiated fuel inside containment? Is it through the description in the FSAR that it is known that the containment isolation phase A signal applies to applicable modes 1 through 6 and footnote (a), and the fuel building exhaust radiation gaseous signal applies to applicable mode footnote (c), for the two functions being changed in the table.

Response

As described in the response to Question 10, the proposed amendment removes the TS requirement for automatic isolation of the Containment Purge and Exhaust System during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. Bypassing the automatic containment purge isolation during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment also bypasses the automatic CREVS actuation from the containment purge exhaust radiation channels.

The control room air intake radiation channels (GKRE0004 and GKRE0005) will now be credited as the primary means to ensure that automatic CREVS actuation occurs on high gaseous radiation following a postulated fuel handling accident inside containment. Formerly, no accident analyses credited the GKRE0004 and GKRE0005 channels. TS 3.3.7, "Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation", is being revised to add a new surveillance requirement to response time test these channels. New requirements for this response time testing surveillance are being included in TS Table 3.3.7-1 for Functions 2 and 3 during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment.

Function 5, "Fuel Building Exhaust Radiation – Gaseous", is added to Table 3.3.7-1 to distinguish instrumentation requirements for the postulated fuel handling accident should it occur inside the fuel building rather than inside containment. Fuel building exhaust radiation channels (GGRE0027 and GGRE0028) are credited to provide automatic CREVS actuation should a fuel handling accident occur inside the fuel building. As indicated in Table 3.3.7-1 (Function 5), LCO 3.3.8, "EES Actuation Instrumentation", provides all of the initiation functions and requirements for the instrumentation credited for the postulated fuel handling accident inside the fuel building. However, the Required Actions in TS 3.3.8 must be modified to include actions to place a CREVS train(s) in the CRVIS mode. LCO 3.3.8 applies only during the movement of irradiated fuel assemblies in the fuel building. New mark-ups for TS 3.3.8 are provided as Attachment 2 to these Questions and Responses and provide proposed revisions to TS 3.3.8 CONDITIONS and REQUIRED ACTIONS. Attachment 2 includes TS pages 3.3-65 and 3.3-66 which were not included in the original submittal, ULNRC-04574, dated December 6, 2001.

Finally, Functions 1-3 in Table 3.3.7-1 will be applicable in MODES 1 through 6, during CORE ALTERATIONS, or during movement of irradiated fuel assemblies within containment (as noted in revised footnote (a)). In addition, Functions 1 and 2 in Table 3.3.7-1 will also be applicable during movement of irradiated fuel assemblies in the fuel building. Table 3.3.7-1, "Containment Isolation – Phase A" (Function 4), refers to LCO 3.3.2, "ESFAS Instrumentation" (Function 3.a) for all initiation functions and requirements (applicable only in MODES 1-4, except for the SI analog channel inputs of LCO 3.3.2 Functions 1.c, 1.d, and 1.e).

In order to implement the proposed LAR, the intent was to delete only the automatic CPIS actuation on high purge exhaust radiation during core alterations or fuel movement inside containment. This is necessary to ensure a controlled and monitored release (in the event of a postulated FHA inside containment), through the purge system rather than out the open containment equipment hatch. The proposed change would ensure operation, i.e., prevent isolation, of the purge system during refueling activities. Without deleting the automatic CPIS actuation, and assuming a postulated FHA inside containment, the purge system would isolate on high purge exhaust radiation prior to closing the containment equipment hatch. This would potentially allow an uncontrolled and unmonitored release via the open containment equipment hatch.

Based on the Callaway design, deleting the automatic CPIS actuation on high purge exhaust radiation also removes the automatic CREVS actuation from CPIS on that signal. Removing the automatic CREVS actuation on a CPIS has already been accounted for in the control room dose calculations that credit automatic CREVS actuation on high control room air intake radiation (GKRE0004, GKRE0005 channels).

Although deleting the automatic CPIS actuation on high purge exhaust radiation also removes the associated automatic CREVS actuation, the change does not impact the actuation of CREVS within the fuel building. Fuel building exhaust radiation channels (GGRE0027 and GGRE0028) continue to be credited for providing automatic CREVS actuation should a postulated FHA occur inside the fuel building. Function 5, "Fuel Building Exhaust Radiation-Gaseous" is added to Table 3.3.7-1 to distinguish the instrumentation requirements for the postulated FHA inside the fuel building from the requirements for the postulated FHA inside containment. There is no effect on the fuel building FHA analysis and the dose consequences to the control room remain unchanged.

It should be noted that an operating Containment Purge and Exhaust System following a RBFHA will not result in any increase in the Licensing Bases radiological consequences for a RBFHA. Additionally, the operating Containment Purge and Exhaust System will not result in an increase in plant effluents during normal plant operations.

Question 14

For the (1) automatic actuation logic and actuation relays function and (2) control room radiation control room intakes function in TS Table 3.3.7-1, the proposal is to add footnote (c) to the applicable modes column of the table. The existing table has Modes 1 through 6 and footnote (a) as the current applicable modes. Discuss why the surveillance requirements for the two functions are different for the two sets of applicable modes. Include in this discussion for the two functions why (1) the control room ventilation isolation ESF response time (i.e., proposed SR 3.3.7.6) should not be applied to the current applicable modes, (2) there is no requirement for performing SRs 3.3.7.1, 3.3.7.2, 3.3.7.4, or 3.3.7.5 in line with the proposed footnote (c) and SR 3.3.7.6, and (3) why there should not be a nominal trip setpoint specified for the two functions in line with the proposed footnote (c) and SR 3.3.7.6.

Response

Current footnote (a) addresses Functions 1-3 of Table 3.3.7-1, which are needed during any movement of irradiated fuel assemblies. However, Functions 1-3 of Table 3.3.7-1 will now be credited to reduce control room doses in the following situations: 1) in MODES 1-4 for a LOCA or SGTR; 2) in MODES 5 and 6 for a waste gas decay tank rupture; and 3) during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment for a fuel handling accident (FHA) inside containment. The only other plant condition involving movement of irradiated fuel assemblies will now be addressed by Functions 1 and 2 and new Function 5 of Table 3.3.7-1 for a FHA in the fuel building. As such, there is no basis to retain current footnote (a). Current footnote (a) should be deleted and replaced with the wording from the submitted version (ULNRC-04574) of new footnote (c). A separate footnote (c) should be added for Functions 1 and 2 only that says "During movement of irradiated fuel assemblies in the fuel building."

The intent of the second, Applicability-specific entries in Table 3.3.7-1 for Functions 2 and 3 is that the new response time test surveillance should only apply during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment since those are the only plant conditions for which response time is a relevant, credited consideration. However, as noted in Question 14, response time testing is not the only surveillance that must be performed in order to credit Functions 2 and 3 to address a FHA inside containment. In order to credit automatic CREVS actuation during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment, the ACTUATION LOGIC TEST (SR 3.3.7.3) for Function 2 must be current and the CHANNEL CHECK (SR 3.3.7.1), COT (SR 3.3.7.2), and CHANNEL CALIBRATION (SR 3.3.7.5) for Function 3 must be current in addition to the new channel response time testing SR 3.3.7.6. The reasons for having a second listing for the new response time testing surveillance, other than the obvious correlation between plant conditions and credited analysis assumptions, are that the surveillance can be performed in any plant condition other than revised footnote (a) discussed above and there is no MODE 4 entry hold from MODE 5 per SR 3.0.4 if the new SR 3.3.7.6 comes due (with the +25% extension per SR 3.0.2 already considered) after the vessel head is installed but prior to MODE 4 entry. A revised mark-up of Table 3.3.7-1 and new mark-up of TS 3.3.7 Condition E are attached herewith.

Question 15

For footnote c in the previous question, discuss if the following phrase should be added to the footnote: "and the equipment hatch is open."

Response

See the response to Question 11.