

Docket Number 50-346
License Number NPF-3
Serial Number 2288
Enclosure
Page 1

APPLICATION FOR AMENDMENT
TO
FACILITY OPERATING LICENSE NPF-3
DAVIS-BESSE NUCLEAR POWER STATION
UNIT NUMBER 1


Attached are requested changes to the Davis-Besse Nuclear Power Station, Unit Number 1 Facility Operating License Number NPF-3. Also included is the Safety Assessment and Significant Hazards Consideration.

The proposed changes (submitted under cover letter Serial Number 2288) concern:

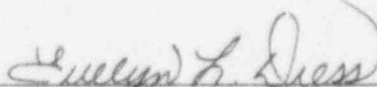
Appendix A, Technical Specification 3/4.9.4, Refueling Operations - Containment Penetrations

Appendix A, Technical Specification Bases 3/4.9.4, Containment Penetrations

By:


J. P. Stetz, Vice President - Nuclear

Sworn and subscribed before me this 7th day of June, 1995.


Notary Public, State of Ohio

EVELYN L. DRESS
Notary Public, State of Ohio
My Commission Expires 7/28/98

9506130062 950607
PDR ADDCK 05000346
P PDR

Docket Number 50-346
License Number NPF-3
Serial Number 2288
Enclosure
Page 2

The following information is provided to support issuance of the requested changes to Davis-Besse Nuclear Power Station, Unit Number 1 Operating License Number NPF-3, Appendix A, Technical Specification (TS) 3/4.9.4, Refueling Operations - Containment Penetrations, and associated Bases 3/4.9.4, Containment Penetrations.

- A. Time Required to Implement: This change is to be implemented within 90 days after NRC issuance of the License Amendment.
- B. Reason for Change (License Amendment Request Number 95-0001, Revision 0):

The proposed change would revise TS Limiting Condition for Operation (LCO) 3.9.4.b to allow both doors of the containment personnel airlock to be open during core alterations or movement of irradiated fuel within the containment, provided that certain specified conditions are met. This proposed change would eliminate the need for the use of temporary containment personnel air lock doors during refueling (Mode 6) operations involving core alterations or movement of irradiated fuel within containment. Eliminating the need for the use of these temporary doors would eliminate the costs involved in their installation, testing, and removal each refueling outage. The proposed change would also clarify TS LCO 3.9.4.c, and would make administrative changes to Action statement 3.9.4.a and Surveillance Requirement (SR) 4.9.4. Associated changes to the Bases are also proposed.

- C. Safety Assessment and Significant Hazards Consideration: See Attachment

Docket Number 50-346
License Number NPF-3
Serial Number 2288
Attachment

SAFETY ASSESSMENT AND SIGNIFICANT HAZARDS CONSIDERATION
FOR
LICENSE AMENDMENT REQUEST 95-0001

(17 pages follow)

SAFETY ASSESSMENT AND SIGNIFICANT HAZARDS CONSIDERATION
FOR
LICENSE AMENDMENT REQUEST NUMBER 95-0001

TITLE:

Revision of Technical Specification (TS) 3/4.9.4, Refueling Operations - Containment Penetrations, and associated Bases 3/4.9.4, Containment Penetrations.

DESCRIPTION:

The purpose of the proposed changes is to modify the Davis-Besse Nuclear Power Station (DBNPS) Operating License NPF-3, Appendix A Technical Specifications (TS) and associated Bases. The proposed changes would allow both doors of the containment personnel air lock to be open during core alterations or movement of irradiated fuel within the containment, provided that certain specified conditions are met. Various other clarifications and administrative changes are also proposed, as described in detail below.

Updated Safety Analysis Report (USAR) Section 3.8.2.1, Containment Vessel, describes the two air locks which provide personnel access into the containment: a personnel air lock and an emergency air lock. These are welded steel assemblies. Each air lock has two double-gasketed doors in series. Each door is designed so that with the other door in the same air lock open, the closed door can withstand and seal against the design pressures of the containment vessel. In Modes 1 through 4, both doors in each air lock are maintained closed except when the air lock is being used for normal transit entry and exit through the containment. In Modes 5 and 6, both doors may be open except during core alterations or movement of irradiated fuel within the containment, when, in accordance with current Technical Specifications, at least one of the doors in each air lock is required to be closed.

During a refueling outage, other work in the containment does not stop during fuel movement and core alterations. Numerous containment entries through the personnel air lock are required. As described in an October 6, 1989 letter to the NRC (TE Serial Number 1710), beginning in the fifth refueling outage in 1988, the DBNPS has utilized temporary containment personnel air lock doors during refueling (Mode 6) operations involving core alterations or movement of irradiated fuel within containment. The temporary air lock doors are used in place of the normal air lock doors for compliance with TS LCO 3.9.4 requirements. The temporary doors are effective in precluding the potential damage to the normal air lock door latching mechanisms during periods of frequent openings and closings, while

providing the necessary barriers for mitigating the consequences of a fuel handling accident in Mode 6, when the potential for containment pressurization does not exist.

TS Limiting Condition for Operation (LCO) 3.9.4 is applicable during core alterations or movement of irradiated fuel within the containment. LCO 3.9.4.b presently requires that a minimum of one door in each air lock be closed. The proposed change would revise LCO 3.9.4.b to read:

A minimum of one door in each air lock closed, but both doors of the containment personnel air lock may be open provided that at least one personnel air lock door is capable of being closed and a designated individual is available immediately outside the personnel air lock to close the door.

This proposed change would eliminate the need for use of the temporary doors, and would eliminate the costs involved in installation, testing, and removal of the temporary doors each refueling outage.

USAR Section 3.8.2 describes the containment structures. The containment consists of three basic structures: a steel containment vessel, a reinforced concrete shield building, and the internal structures. The containment vessel, including all its penetrations, is a low leakage steel structure designed to withstand a postulated loss-of-coolant accident and to confine a postulated release of radioactive material. The shield building is a concrete structure surrounding the containment vessel. It is designed to provide biological shielding during normal operation and from hypothetical accident conditions. An annular space, referred to as the "annulus", is provided between the containment vessel and the shield building. There are several large ventilation openings from the auxiliary building to the annulus (through the shield building wall). TS LCO 3.9.4.c places requirements on penetrations providing direct access from the containment atmosphere to the outside atmosphere. Since the term "outside atmosphere", when used in the context of LCO 3.9.4.c, means anywhere outside the containment vessel (including the annulus and the auxiliary building), a clarification is proposed for LCO 3.9.4.c changing the term "outside atmosphere" to "atmosphere outside containment."

TS LCO 3.9.4.c.1 states, as one alternative, that penetrations providing direct access from the containment atmosphere to the outside atmosphere shall be "closed by an isolation valve, blind flange, or manual valve." The proposed change would revise this alternative to read "closed by a manual or automatic isolation valve, blind flange, or equivalent." This change would clarify that it is acceptable to use equivalent means to a valve or blind flange in temporarily sealing a penetration.

TS Action 3.9.4.a includes a statement that the provisions of Specification 3.0.3 are not applicable. Since this statement is redundant to TS Action 3.9.4.c, it is proposed that it be removed.

TS Surveillance Requirement 4.9.4 presently refers to containment penetrations being in closed or isolated conditions. Consistent with the above proposed change to TS LCO 3.9.4.b, references to "closed" or "isolated" conditions are proposed to be changed to "required" conditions.

Associated with the above proposed changes, the first paragraph of TS Bases 3/4.9.4 is proposed to be revised to read:

During CORE ALTERATIONS or movement of irradiated fuel within the containment, release of fission product radioactivity to the environment as a result of a fuel element rupture must be minimized. During MODES 1,2,3, and 4, this is accomplished by maintaining CONTAINMENT INTEGRITY as described in LCO 3.6.1.1. In other situations, the potential for containment pressurization as a result of an accident is not present, and therefore less stringent requirements are needed to isolate the containment from the atmosphere outside containment. Both containment personnel air lock doors may be open during CORE ALTERATIONS or during movement of irradiated fuel within the containment provided the conditions specified in LCO 3.9.4.b are met. The individual designated to be continuously available to close the air lock door must be stationed at the auxiliary building side of the air lock. A containment personnel air lock door is considered capable of being closed if the door is unblocked and there are no cables or hoses being run through the air lock. The LCO 3.9.10 requirement to maintain a minimum of 23 feet of water over the top of irradiated fuel assemblies seated within the reactor pressure vessel during movement of fuel assemblies within the reactor pressure vessel while in MODE 6 ensures that sufficient water depth is available to remove 99% of the assumed iodine gas activity released from the rupture of an irradiated fuel assembly. Further, sufficient time is available to close the personnel air lock following a loss of shutdown cooling before boiling occurs.

Regarding LCO 3.9.4.c, the phrase "atmosphere outside containment" refers to anywhere outside the containment vessel, including (but not limited to) the containment annulus and the auxiliary building.

For penetrations that are closed by a method equivalent to a manual or automatic isolation valve, or a blind flange, the isolation technique must be approved by an engineering evaluation. The isolation technique may include the use of a material that can provide a temporary seal capable of maintaining the integrity of the penetration to restrict the release of radioactive material from a fuel handling accident.

These changes are shown in the attached, marked-up changes to the Operating License.

This license amendment request is similar to a license amendment request which was approved by the NRC on August 31, 1994 for Facility Operating License Numbers DPR-53 (Calvert Cliffs Nuclear Power Plant, Unit No. 1) (TAC No. M88193), and DPR-69 (Calvert Cliffs Nuclear Power Plant, Unit No. 2) (TAC No. M88194). This license amendment request would also make LCO 3.9.4.c.1 consistent with LCO 3.9.3.c.1 of the Improved Standard Technical Specifications for Babcock and Wilcox Reactors, NUREC 1430, Revision 0.

SYSTEMS, COMPONENTS, AND ACTIVITIES AFFECTED:

Required status of containment penetrations during core alterations or movement of irradiated fuel within the containment.

FUNCTIONS OF THE AFFECTED SYSTEMS, COMPONENTS AND ACTIVITIES:

During core alterations or movement of irradiated fuel within the containment, the requirements placed on the status of containment penetrations ensures that, in the event that a fuel element rupture occurs, the release of fission product radioactivity to the outside environment will be minimized.

EFFECTS ON SAFETY:

Proposed Change to TS LCO 3.9.4.b

The proposed change to TS LCO 3.9.4.b would allow both doors of the containment personnel air lock to be open during core alterations or movement of irradiated fuel within the containment, provided that at least one of the doors is capable of being closed and a designated individual is available immediately outside the personnel air lock to close the door. Under the current Technical Specifications, at least one of the doors in the personnel air lock is required to be closed during core alterations or movement of irradiated fuel within the containment.

There are a large number of people in the containment during a refueling outage, including the time period during which fuel movements and core alterations are occurring. Under the present TS LCO 3.9.4 requirements, in order to maintain at least one personnel air lock door closed should a fuel handling accident occur, it would take several cycles of the air lock to evacuate personnel from the containment. With each cycle, more containment air would be released. Alternatively, the Shift Supervisor could invoke 10 CFR 50.54(x), order both doors opened while the personnel in the containment are evacuated, and then close the doors. In either case, there is a release of activity into the atmosphere. Under the proposed change, the containment could be evacuated without invoking 10 CFR 50.54(x) and then sealed. This would reduce dose to workers in the event of an accident, while maintaining acceptable doses to the public.

Section 15.4.7.3 of the DBNPS Updated Safety Analysis Report (USAR) addresses a fuel handling accident inside containment. The analysis results are well within the 10 CFR 100 guideline values. Since the analysis does not take credit for containment isolation, the status of the containment personnel air lock has no impact on the acceptability of the results. Under the proposed change, with both personnel air lock doors open, the requirements that at least one personnel air lock door be capable of being closed and that a designated individual be available immediately outside the personnel air lock to close the door will minimize the release of radioactive material in the event of a fuel handling accident.

The present TS LCO 3.9.10 requirement to maintain a minimum of 23 feet of water over the top of irradiated fuel assemblies seated within the reactor pressure vessel during movement of fuel assemblies within the reactor pressure vessel while in Mode 6 ensures that sufficient water depth is available to remove 99% of the assumed iodine gas activity released from the rupture of an irradiated fuel assembly. Further, sufficient time is available to close the personnel air lock following a loss of shutdown cooling before boiling occurs.

The applicable design basis accident during Mode 6 is the fuel handling accident. The radiological consequences of the design basis fuel handling accident inside containment are analyzed assuming no containment isolation or filtration. USAR Section 15.4.7.3 describes the analyses, including applicable assumptions, and provides the resultant doses at the exclusion area boundary and at the low population zone (LPZ) boundary. Anticipated control room operator doses were not previously calculated as part of this analysis, however an analysis has recently been performed using the following assumptions:

- a. The accident occurs at 72 hours following reactor shutdown.
- b. Noble gas and iodine gas activities are based on Regulatory Guide 1.25 and are consistent with USAR Table 15.4.7-6.
- c. One entire assembly is considered damaged.
- d. The gas activity in the damaged fuel assembly is assumed to be released to the pool. All the noble gas activities that are released to the pool are assumed to escape from the pool; one percent of the iodine activities that are released to the pool are assumed to escape from the pool.
- e. No credit is taken for containment isolation limiting the radioactive release.
- f. Although the containment purge system exhausts air through charcoal filters, no credit is taken for iodine removal by these filters.
- g. All the gas activity released to the containment is assumed to be released to the environment over a 2 hour period.
- h. The control room normal HVAC air intake, which is more than 160 feet from the release point, is automatically isolated upon receipt of a high radiation signal from the station vent, prior to the release from containment reaching the intake.
- i. Atmospheric dispersion factor (X/Q) at the control room is 5.85×10^{-4} sec/m³.
- j. Air inleakage rate into the control room is assumed to be 0.06 air changes per hour, which equates to approximately 54 cfm.
- k. No credit is taken for the control room emergency ventilation system to remove iodine activity leaked into the control room.

1. Normal control room HVAC is assumed to be established 2 hours following initiation of the accident.

The analysis shows that the resulting thyroid dose to a control room operator is less than 22 rem. This result is within the limits of 5 rem whole body, or its equivalent to any part of the body (30 rem thyroid per Standard Review Plan 6.4), as provided in 10 CFR 50 Appendix A General Design Criteria (GDC) 19, "Control Room," and is independent of whether the containment personnel air lock is open or closed since containment isolation is not assumed. The assumptions used are also extremely conservative in that containment isolation would be expected to occur, including prompt closure of the containment personnel air lock, if open. Furthermore, there is no driving force to push containment air out through the air lock in the event it is open. The assumed air inleakage rate into the control room is also very conservative compared to other USAR Chapter 15 accident analyses. For example, the USAR Section 15.4.7.2 analysis for a fuel handling accident outside containment assumes a control room inleakage of 1 cfm, and the USAR Section 15.4.8 analysis of the effects of toxic material release on the control room assumes a control room inleakage of 25 cfm.

In summary, the proposed change to TS LCO 3.9.4.b would not result in unacceptable doses to the public, would not impact control room habitability, and would potentially reduce the doses to containment workers in the event of an accident. Therefore, it is concluded that this proposed change would have no adverse effect on plant safety.

Proposed Changes to TS LCO 3.9.4.c

The proposed change to LCO 3.9.4.c, changing the term "outside atmosphere" to "atmosphere outside containment", is an administrative clarification and has no adverse effect on plant safety.

Regarding the proposed change to LCO 3.9.4.c.1, as described in proposed Bases 3/4.9.4 an engineering evaluation will be required for the use of an "equivalent" closure technique (other than a manual or automatic isolation valve, or a blind flange) for closing a containment penetration during core alterations or movement of irradiated fuel within the containment. The engineering evaluation will ensure that the closure technique is capable of restricting the release of radioactive material from a fuel handling accident. Therefore, it is concluded that this proposed change has no adverse effect on plant safety.

Other Proposed Changes

The proposed change to TS Action 3.9.4.a, which removes a statement regarding the provisions of Specification 3.0.3 since the statement is redundant to TS Action 3.9.4.c, is an administrative change and has no adverse effect on plant safety.

The proposed changes to TS Surveillance Requirement 4.9.4, which changes references to penetrations being in a "closed" or "isolated" condition to read "required" condition, are administrative changes associated with the proposed change to TS LCO 3.9.4.b. These changes have no adverse effect on plant safety.

The proposed changes to TS Bases 3/4.9.4 are administrative changes associated with the proposed changes to TS LCO 3.9.4.b and 3.9.4.c. These changes have no adverse effect on plant safety.

SIGNIFICANT HAZARDS CONSIDERATION:

The Nuclear Regulatory Commission has provided standards in 10 CFR 50.92(c) for determining whether a significant hazard exists due to a proposed amendment to an Operating License for a facility. A proposed amendment involves no significant hazards if operation of the facility in accordance with the proposed changes would: (1) Not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) Not create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) Not involve a significant reduction in a margin of safety. Toledo Edison has reviewed the proposed changes and determined that a significant hazards consideration does not exist because operation of the Davis-Besse Nuclear Power Station (DBNPS), Unit No. 1, in accordance with these changes would:

- 1a. Not involve a significant increase in the probability of an accident previously evaluated because no Updated Safety Analysis Report (USAR) accident initiators are affected by the proposed changes.

The proposed change to Technical Specification (TS) Limiting Condition for Operation (LCO) 3.9.4.b would allow both doors of the containment personnel air lock to be open during core alterations or movement of irradiated fuel within the containment, provided that certain specified conditions are met. The containment personnel air lock is not an initiator to any accident. Whether the containment personnel air lock doors are open or closed during fuel movement and core alterations has no effect on the probability of any accident previously evaluated.

The proposed clarification of TS LCO 3.9.4.c, changing the term "outside atmosphere" to "atmosphere outside containment," and the proposed change to TS LCO 3.9.4.c.1, confirming that, in addition to a manual or automatic isolation valve, or a blind flange, equivalent means may be used to close a containment penetration, have no bearing on the probability of an accident previously evaluated.

The proposed changes to TS Action 3.9.4.a, TS Surveillance Requirement (SR) 4.9.4, and TS Bases 3/4.9.4 are administrative changes and have no bearing on the probability of an accident previously evaluated.

- 1b. Not involve a significant increase in the consequences of an accident previously evaluated because the proposed changes do not invalidate accident conditions or assumptions used in evaluating the radiological consequences of any accident.

The analysis results for a fuel handling accident inside containment, as presented in Section 15.4.7.3 of the DBNPS Updated Safety Analysis Report (USAR), are well within the 10 CFR 100 guideline

values. Since the analysis does not take credit for containment isolation, the status of the personnel air lock has no impact on the acceptability of the results. In the event of a fuel handling accident, release of radioactive material will continue to be minimized since the air lock door will remain capable of being closed. Further, the proposed change could significantly reduce the dose to workers in the containment in the event of a fuel handling accident by speeding the containment evacuation process.

Since an engineering evaluation described in proposed Bases 3/4.9.4 will ensure that a particular containment penetration closure technique is capable of restricting the release of radioactive material from a fuel handling accident, the proposed change to TS LCO 3.9.4.c.1, confirming that an equivalent means may be used to close a containment penetration, has no adverse effect on the consequences of an accident previously evaluated.

The proposed clarification of TS LCO 3.9.4.c, and the proposed changes to TS Action 3.9.4.a, TS SR 4.9.4, and TS Bases 3/4.9.4 are administrative changes and have no effect on the consequences of an accident previously evaluated.

2. Not create the possibility of a new or different kind of accident from any accident previously evaluated because there are no new failure modes or mechanisms associated with the proposed changes, nor do the proposed changes involve any modification of plant equipment or changes in plant operational limits.

As described above, the analysis results for a fuel handling accident inside containment does not take credit for containment isolation. Thus the proposed change to TS LCO 3.9.4.b to allow both doors of the containment personnel air lock to be open during core alterations or movement of irradiated fuel within the containment could affect the release path for radioactive material released during a fuel handling accident, however no new or different kind of accident will result.

3. Not involve a significant reduction in a margin of safety.

The analysis results for a fuel handling accident inside containment, as presented in the DBNPS USAR, are well within the 10 CFR 100 guideline values. Since the analysis does not take credit for containment isolation, the status of the personnel air lock has no impact on the acceptability of the results.

The proposed change to TS LCO 3.9.4.c.1 regarding the use of equivalent means of containment penetration closure has no adverse impact on the margin of safety since an equivalent containment penetration closure technique will provide the same assurance of containment closure during core alternatives or movement of irradiated fuel inside containment.

The various administrative changes and clarifications proposed will not reduce the margin of safety.

CONCLUSION:

On the basis of the above, Toledo Edison has determined that the License Amendment Request does not involve a significant hazards consideration. As this License Amendment Request concerns a proposed change to the Technical Specifications that must be reviewed by the Nuclear Regulatory Commission, this License Amendment Request does not constitute an unreviewed safety question.

ATTACHMENT:

Attached are the proposed marked-up changes to the Operating License.

REFERENCES:

1. Title 10 Code of Federal Regulations (CFR) Part 50, Section 50.54, "Conditions of Licenses," Appendix A, "General Design Criteria for Nuclear Power Plants," and Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors."
2. Title 10 Code of Federal Regulations (CFR) Part 100, "Reactor Site Criteria."
3. Amendment No. 194 (TAC No. M88193) to Facility Operating License (FOL) No. DPR-53, Calvert Cliffs Nuclear Power Plant Unit No. 1, and Amendment No. 171 (TAC No. M88194) to FOL No. DPR-69 Calvert Cliffs Nuclear Power Plant Unit No. 2, both dated August 31, 1994.
4. "Improved Standard Technical Specifications for Babcock and Wilcox Reactors," NUREG-1430, Revision 0, dated September 1992.
5. Updated Safety Analysis Report (USAR) Sections 1.2.10, "Containment Systems," 3.8.2.1, "Containment Vessel," 15.4.7.2, "Accident Analysis - Accident Outside Containment," 15.4.7.3, "Accident Analysis - Accident Inside Containment," and 15.4.8, "Effects of Toxic Material Release in the Control Room."
6. Toledo Edison Serial Number 1710, dated October 6, 1989, Subject: "Use of Temporary Containment Personnel Airlock Doors During Refueling Operations."
7. Calculation No. C-NSA-028.01-002
8. NUREG-0800 Standard Review Plan 6.4, "Control Room Habitability System," Revision 2, July 1981.
9. 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," March 23, 1972 (Safety Guide 25).