# Industry/TSTF Standard Technical Specification Change Traveler

**Revise Incorrect Bases for Containment Air Temperature**

Classification: 2) Bases Only Change

**Priority: 4)Edit/Bases**

NUREGs Affected: ☑ 1430 ☑ 1431 ☑ 1432 ☑ 1433 ☑ 1434

**Description:**
Revise an incorrect statement in the ISTS Bases for the containment air temperature LCO to indicate that an initial temperature consistent with the LCO assures that the temperature profile resulting from a DBA will not cause the containment structure to exceed its design temperature and that required safety related equipment within the containment will not exceed allowable operating temperatures.

**Justification:**
The existing LCO Bases states that the peak accident temperature is maintained below the containment design temperature. This statement is inaccurate. The typical accident analysis shows that the peak containment air temperature resulting from a steam line break exceeds the containment design temperature momentarily during the transient. Figure 1 shows a typical response of containment temperature that would occur during a steam line break. Figure 2 is representative of temperatures observed by various components in containment during a steam line break. As discussed in 10 CFR 50.49, the basis for containment temperature is to ensure the performance of safety related equipment. The typical steam line break analysis identifies that the time interval during which the containment air temperature exceeds the containment design temperature is a short duration such that the equipment surface temperature (including the structure) remained below the design temperature.

This proposed changes is a Bases only change and should not be processed under the Consolidated Line Item Improvement Program (CLIIP) since licensees can make this change in accordance with 10 CFR 50.59. As such, a safety evaluation quality justification and a no significant hazards consideration determination is not required for the proposed change.


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|---|---|---|---|
| Industry Contact: | Wideman, Steve | (316) 364-4037 | stwidem@wcnoc.com |
| NRC Contact: | Giardina, Bob | 301-415-3152 | lbb1@nrc.gov |


## Revision History

### OG Revision 0 Revision Status: Closed

Revision Proposed by: Seabrook

Revision Description:
Original Issue

### Owners Group Review Information

Date Originated by OG: 23-Jun-98

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 23-Jun-98

### TSTF Review Information

TSTF Received Date: 12-Oct-98 Date Distributed for Review 12-Oct-98

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

## OG Revision 0 Revision Status: Closed

TSTF Comments:

CEOG believes this is applicable to CE and does not approve. WOG to put on hold to have further discussion with other OGs. BWROG and BWOG have a similar statement.

TSTF Resolution: Superceeded Date: 12-Oct-98

## OG Revision 1 Revision Status: Active Next Action: NRC

Revision Proposed by: WOG

Revision Description:
On 11/20/98, a TSTF Action Item (#75) was assigned to Denny Buschbaum to develop resolution to TSTF questions on WOG-124 and bring back to the TSTF.

In September 2000, the Working Group Chairman reviewed the list of TSTF Action Items and followed up on this item to determine what the TSTF questions were. The TSTF meeting minutes from the 11/98 time frame indicate the following comments:

· CEOG believes this is applicable to CE and does not approve
· Denny B to put on hold to have further discussions with other OGs
· BWROG and BWOG have a similar statement

This was the extent of the comments that could be found as to what questions/concerns the TSTF had regarding the subject WOG traveler.

Further review was performed to evaluate the need for the change. Provided below is a discussion concerning what was reviewed.

1. As part of the Wolf Creek and Diablo Canyon conversion amendment application, the LCO Bases wording was revised. The NRC reviewer (Bob Giardina) issued a RAI associated with the changes. A revision to the Bases wording was agreed upon with the NRC reviewer and licensees.

2. The USAR for Wolf Creek was reviewed and the containment analysis engineer queried concerning the temperature profiles for the worst case accident. A review of the temperature profiles for the containment temperature and surface temperature from the main steam line break analysis concluded that the peak accident temperature will exceed the containment design temperature for a short period of time. However, containment structure temperature and equipment surface temperatures remained below the containment design temperature.

3. This information was discussed with a Westinghouse containment analyst to determine if it these temperature profiles were fairly consistent for the Westinghouse plants. The analyst indicated that it was his belief that the temperature will spike above the design temperature. The containment analyst believed that the wording in the STS Bases should be revised.

### Owners Group Review Information

Date Originated by OG: 02-Feb-01

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 11-Feb-01

**OG Revision 1** **Revision Status: Active** **Next Action: NRC**

## TSTF Review Information

TSTF Received Date: 11-Feb-01 Date Distributed for Review 06-Apr-01

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
Applicable to all.

TSTF Resolution: Approved Date: 02-May-01

## NRC Review Information

NRC Received Date: 24-May-01

NRC Comments:
(No Comments)

Final Resolution: NRC Action Pending Final Resolution Date:

## Incorporation Into the NUREGs

File to BBS/LAN Date: TSTF Informed Date: TSTF Approved Date:

NUREG Rev Incorporated:

## Affected Technical Specifications

| | | |
|---|---|---|
| LCO 3.6.5 Bases | Containment Air Temperature | NUREG(s)- 1430 Only |
| LCO 3.6.5.A Bases | Containment Air Temperature (Atmospheric and Dual) | NUREG(s)- 1431 Only |
| LCO 3.6.5.B Bases | Containment Air Temperature (Ice Condenser) | NUREG(s)- 1431 Only |
| LCO 3.6.5.C Bases | Containment Air Temperature (Subatmospheric) | NUREG(s)- 1431 Only |
| LCO 3.6.5.A Bases | Containment Air Temperature (Atmospheric and Dual) | NUREG(s)- 1432 Only |
| LCO 3.6.1.5 Bases | Drywell Air Temperature | NUREG(s)- 1433 Only |
| LCO 3.6.1.5 Bases | Primary Containment Air Temperature | NUREG(s)- 1434 Only |

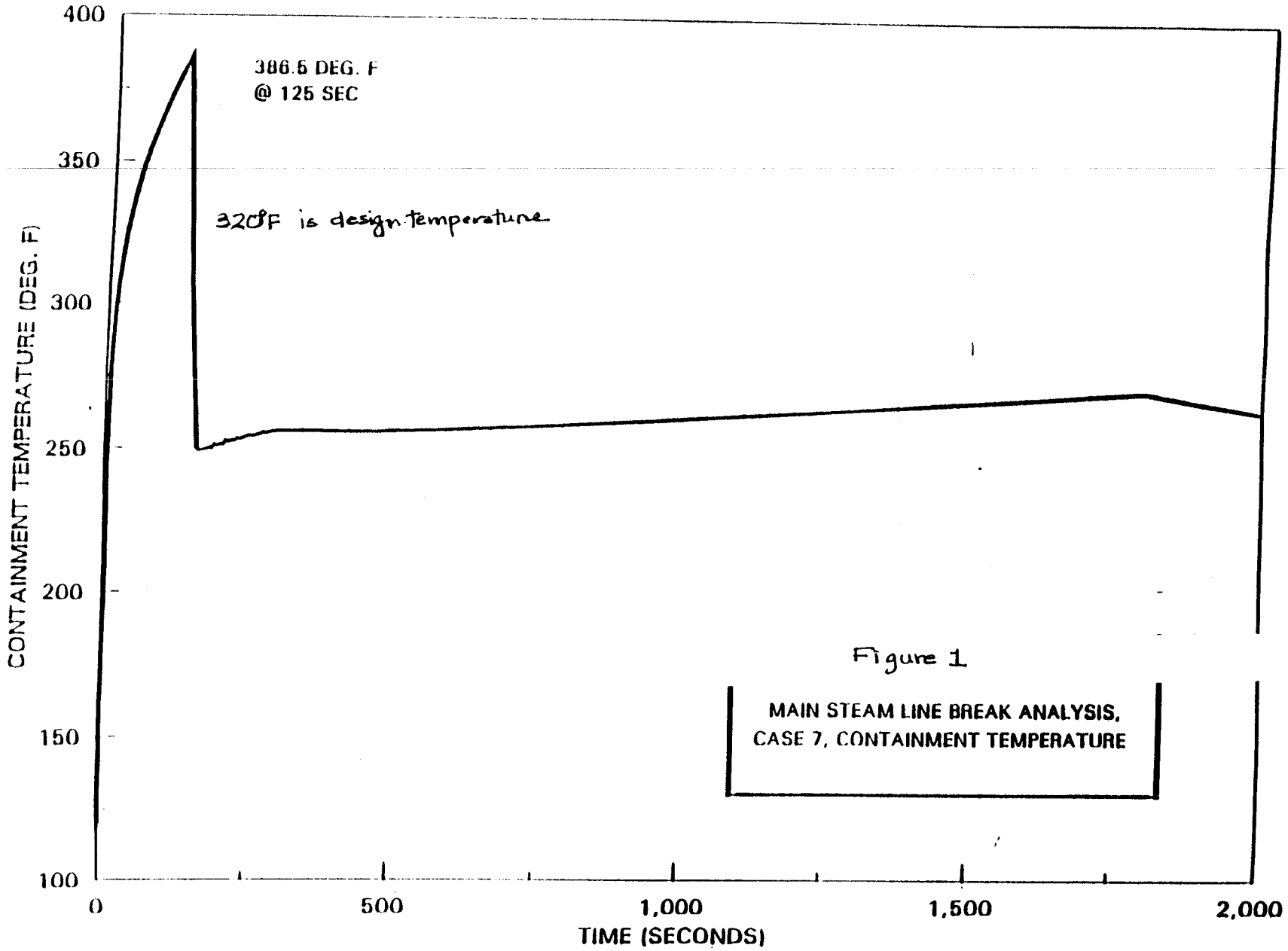


Figure 1

MAIN STEAM LINE BREAK ANALYSIS,
CASE 7, CONTAINMENT TEMPERATURE

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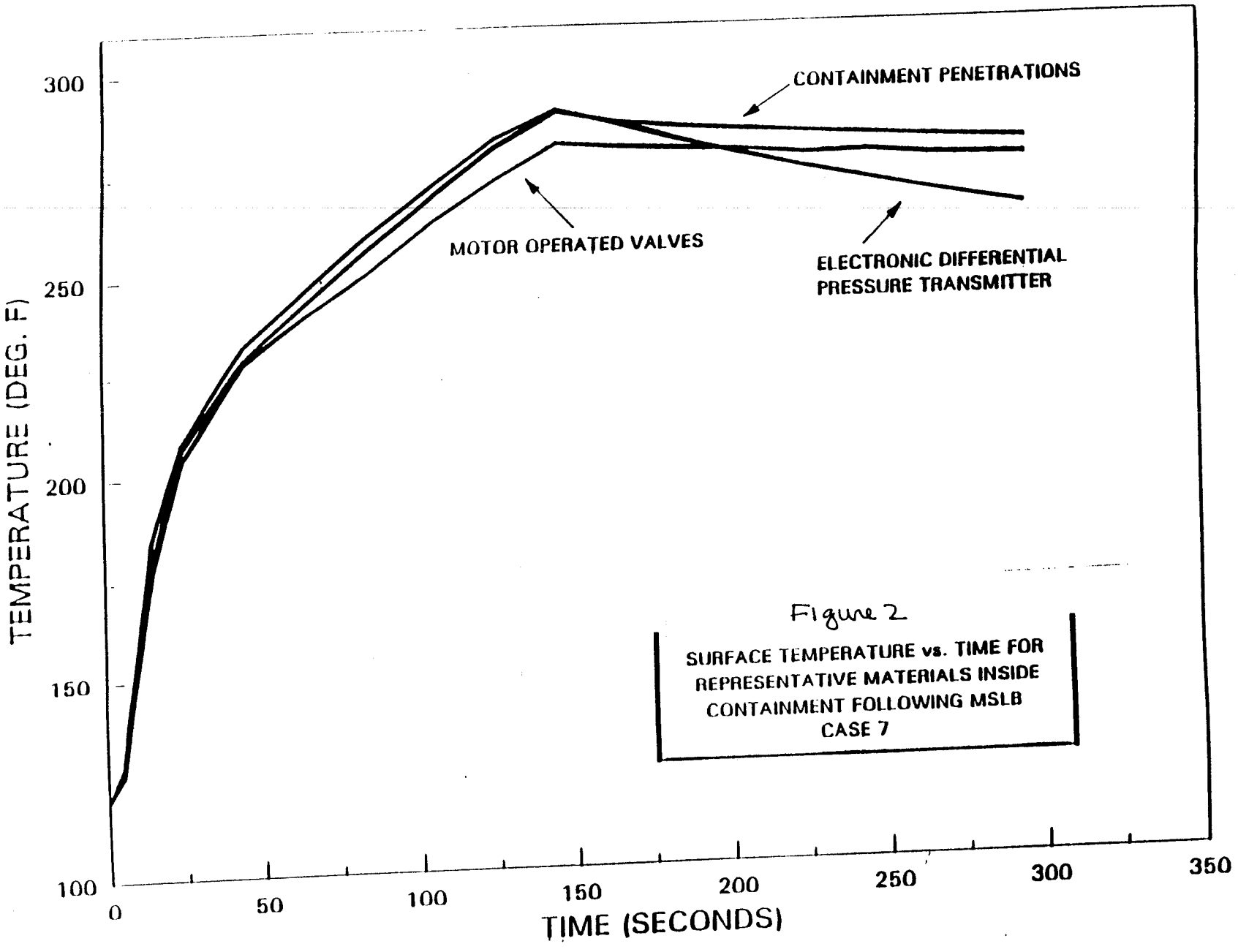


Figure 2

SURFACE TEMPERATURE vs. TIME FOR REPRESENTATIVE MATERIALS INSIDE CONTAINMENT FOLLOWING MSLB CASE 7

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**INSERT 1**

accident temperature profile assures that the containment structural temperature is maintained below its design temperature and that required safety related equipment will continue to perform its function.

**INSERT 2**

accident temperature profile assures that the drywell structural temperature is maintained below its design temperature and that required safety related equipment will continue to perform its function.

**INSERT 3**

resultant accident temperature profile assures that the primary containment structural temperature is maintained below its design temperature and that required safety related equipment will continue to perform its function.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

Containment average air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Insert 1

During a DBA, with an initial containment average air temperature less than or equal to the LCO temperature limit, the resultant peak accident temperature is maintained below the containment design temperature. As a result, the ability of containment to perform its design function is ensured.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining containment average air temperature within the limit is not required in MODE 5 or 6.

ACTIONS

A.1

When containment average air temperature is not within the limit of the LCO, it must be restored within 8 hours. This Required Action is necessary to return operation to within the bounds of the containment analysis. The 8 hour Completion Time is acceptable considering the sensitivity of the analysis to variations in this parameter and provides sufficient time to correct minor problems.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying that containment average air temperature is within the LCO limit ensures that containment operation remains within the limit assumed for the containment analyses. In order to determine the containment

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The limiting DBA for the maximum peak containment air temperature is an SLB. The initial containment average air temperature assumed in the design basis analyses (Ref. 1) is [120]°F. This resulted in a maximum containment air temperature of [384.9]°F. The design temperature is [320]°F.

The temperature limit is used to establish the environmental qualification operating envelope for containment. The maximum peak containment air temperature was calculated to exceed the containment design temperature for only a few seconds during the transient. The basis of the containment design temperature, however, is to ensure the performance of safety related equipment inside containment (Ref. 2). Thermal analyses showed that the time interval during which the containment air temperature exceeded the containment design temperature was short enough that the equipment surface temperatures remained below the design temperature. Therefore, it is concluded that the calculated transient containment air temperature is acceptable for the DBA SLB.

The temperature limit is also used in the depressurization analyses to ensure that the minimum pressure limit is maintained following an inadvertent actuation of the Containment Spray System (Ref. 1).

The containment pressure transient is sensitive to the initial air mass in containment and, therefore, to the initial containment air temperature. The limiting DBA for establishing the maximum peak containment internal pressure is a LOCA. The temperature limit is used in this analysis to ensure that in the event of an accident the maximum containment internal pressure will not be exceeded.

Containment average air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Insert 1

During a DBA, with an initial containment average air temperature less than or equal to the LCO temperature limit, the resultant peak accident temperature is maintained below the containment design temperature. As a result, the ability of containment to perform its design function is ensured.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The limiting DBA for the maximum peak containment air temperature is an SLB. For the upper compartment, the initial containment average air temperature assumed in the design basis analyses (Ref. 1) is [110]°F. For the lower compartment, the initial average containment air temperature assumed in the design basis analyses is [120]°F. This resulted in a maximum containment air temperature of [326]°F. The design temperature is [250]°F.

The temperature upper limits are used to establish the environmental qualification operating envelope for both containment compartments. The maximum peak containment air temperature for both containment compartments was calculated to exceed the containment design temperature for only a few seconds during the transient. The basis of the containment design temperature, however, is to ensure the performance of safety related equipment inside containment (Ref. 2). Thermal analyses showed that the time interval during which the containment air temperature exceeded the containment design temperature was short enough that the equipment surface temperatures remained below the design temperature. Therefore, it is concluded that the calculated transient containment air temperatures are acceptable for the DBA SLB.

The temperature upper limits are also used in the depressurization analyses to ensure that the minimum pressure limit is maintained following an inadvertent actuation of the Containment Spray System for both containment compartments.

The containment pressure transient is sensitive to the initial air mass in containment and, therefore, to the initial containment air temperature. The limiting DBA for establishing the maximum peak containment internal pressure is a LOCA. The temperature lower limits, [85]°F for the upper compartment and [100]°F for the lower compartment, are used in this analysis to ensure that, in the event of an accident, the maximum containment internal pressure will not be exceeded in either containment compartment.

Containment average air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Insert 1 →

During a DBA, with an initial containment average air temperature within the LCO temperature limits, the resultant peak accident temperature is maintained below the containment design temperature. As a result, the ability of containment to perform its design function is ensured. In MODES 3 and 4, containment air temperature may be as low as 60°F

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The limiting DBA for the maximum peak containment air temperature is an SLB. The initial containment average air temperature assumed in the design basis analyses (Ref. 1) is [120]°F. This resulted in a maximum containment air temperature of [357]°F. The design temperature is [347]°F.

The temperature upper limit is used to establish the environmental qualification operating envelope for containment. The maximum peak containment air temperature was calculated to exceed the containment design temperature for only a few seconds during the transient. The basis of the containment design temperature, however, is to ensure the performance of safety related equipment inside containment (Ref. 2). Thermal analyses showed that the time interval during which the containment air temperature exceeded the containment design temperature was short enough that the equipment surface temperatures remained below the design temperature. Therefore, it is concluded that the calculated transient containment air temperature is acceptable for the DBA SLB.

The temperature upper limit is also used in the depressurization analyses to ensure that the minimum pressure limit is maintained following an inadvertent actuation of the QS System (Ref. 1).

The containment pressure transient is sensitive to the initial air mass in containment and, therefore, to the initial containment air temperature. The limiting DBA for establishing the maximum peak containment internal pressure is a LOCA. The temperature lower limit is used in this analysis to ensure that, in the event of an accident, the maximum containment internal pressure will not be exceeded.

Containment average air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Insert 1

During a DBA, with an initial containment average temperature less than or equal to the LCO temperature limits, the resultant peak accident temperature is maintained below the containment design temperature. As a result, the ability of containment to perform its design function is ensured.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and

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BASES

APPLICABLE SAFETY ANALYSES (continued)

containment steel liner and concrete structure reach approximately 230°F and 220°F, respectively. The containment average air temperature limit of [120]°F ensures that, in the event of an accident, the maximum design temperature for containment, [300]°F, is not exceeded. The consequence of exceeding this design temperature may be the potential for degradation of the containment structure under accident loads.

For dual containment, the initial containment condition of [120]°F resulted in a maximum vapor temperature in containment of [413.5]°F. The temperature of the containment steel pressure vessel also reaches approximately [413.5]°F. The containment average temperature limit of [120]°F ensures that, in the event of an accident, the maximum design temperature for containment of [269.3]°F during LOCA conditions and [413.5]°F during MSLB conditions is not exceeded. The consequences of exceeding this design temperature may be the potential for degradation of the containment structure under accident loads. ]

Containment average air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Insert 1

During a DBA, with an initial containment average air temperature less than or equal to the LCO temperature limit, the resultant peak accident temperature is maintained below the containment design temperature. As a result, the ability of containment to perform its function is ensured.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining containment average air temperature within the limit is not required in MODE 5 or 6.

ACTIONS

A.1

When containment average air temperature is not within the limit of the LCO, it must be restored to within limit within 8 hours. This Required Action is necessary to return operation to within the bounds of the containment analysis. The 8 hour Completion Time is acceptable considering the sensitivity of the analysis to variations in this parameter and provides sufficient time to correct minor problems.

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B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.5 Drywell Air Temperature

BASES

BACKGROUND

The drywell contains the reactor vessel and piping, which add heat to the airspace. Drywell coolers remove heat and maintain a suitable environment. The average airspace temperature affects the calculated response to postulated Design Basis Accidents (DBAs). The limitation on the drywell average air temperature was developed as reasonable, based on operating experience. The limitation on drywell air temperature is used in the Reference 1 safety analyses.

APPLICABLE SAFETY ANALYSES

Primary containment performance is evaluated for a spectrum of break sizes for postulated loss of coolant accidents (LOCAs) (Ref. 1). Among the inputs to the design basis analysis is the initial drywell average air temperature (Ref. 1). Analyses assume an initial average drywell air temperature of [135]°F. This limitation ensures that the safety analysis remains valid by maintaining the expected initial conditions and ensures that the peak LOCA drywell temperature does not exceed the maximum allowable temperature of [340]°F (Ref. 2). Exceeding this design temperature may result in the degradation of the primary containment structure under accident loads. Equipment inside primary containment required to mitigate the effects of a DBA is designed to operate and be capable of operating under environmental conditions expected for the accident.

Drywell air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

Insert 2

In the event of a DBA, with an initial drywell average air temperature less than or equal to the LCO temperature limit, the resultant peak accident temperature is maintained below the drywell design temperature. As a result, the ability of primary containment to perform its design function is ensured.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining drywell average air temperature within the limit is not required in MODE 4 or 5.

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B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.5 Primary Containment Air Temperature

BASES

BACKGROUND

Heat loads from the drywell, as well as piping and equipment in the primary containment, add energy to the primary containment airspace and raise airspace temperature. Coolers included in the unit design remove this energy and maintain an appropriate average temperature inside primary containment. The average airspace temperature affects the calculated response to postulated Design Basis Accidents (DBAs). This primary containment air temperature limit is an initial condition input for the Reference 1 safety analyses.

APPLICABLE SAFETY ANALYSES

Primary containment performance for the DBA is evaluated for a entire spectrum of break sizes for postulated loss of coolant accidents (LOCAs) inside containment (Ref. 1). Among the inputs to the design basis analysis is the initial primary containment average air temperature. Analyses assume an initial average primary containment air (and suppression pool) temperature of [95]°F. Maintaining the expected initial conditions ensures that safety analyses remain valid and ensures that the peak LOCA primary containment temperature does not exceed the maximum allowable temperature of 185°F (Ref. 1). Exceeding this design temperature may result in the degradation of the primary containment structure under accident loads. Equipment inside primary containment, and needed to mitigate the effects of a DBA, is designed to operate and be capable of operating under environmental conditions expected for the accident.

Primary containment air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

During a DBA,

LCO

With an initial primary containment average air temperature less than or equal to the LCO temperature limit, the peak accident temperature is maintained below the primary containment design temperature. As a result, the ability of primary containment to perform its design function is ensured.

Insert 3

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining primary