



Entergy Operations, Inc.
 P.O. Box 756
 Port Gibson, MS 39150
 Tel 601 437 6408
 Fax 601 437 2795

Joseph J. Hagan
 Vice President
 Operations
 Grand Gulf Nuclear Station

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U.S. Nuclear Regulatory Commission
 Mail Station P1-37
 Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
 Docket No. 50-416
 License No. NPF-29
Pressure-Temperature Limit Curves
 Proposed Amendment to the Operating License
 (PCOL-96/10)

References: See Attachment 2

GNRO-96/00120

Gentlemen:

Entergy Operations, Inc., Grand Gulf Nuclear Station proposes an amendment to the Operating License. The proposed amendment revises Technical Specification (TS) Figure 3.4.11-1, "Minimum Reactor Vessel Metal Temperature vs. Reactor Vessel Pressure" curves using the methodology of NRC Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." The proposed changes are consistent with the requirements of 10CFR50, Appendix G. In addition, TS Figure 3.4.11-1 is being revised based on the analysis of the flux wire removed during the first refueling outage. This amendment also revises TS Surveillances SR 3.4.11.1 and SR 3.4.11.2 in support of the changes to TS Figure 3.4.11-1.

The included curves have not been prepared using invessel surveillance data based on surveillance capsules. NRC approval to remove the first capsule for material testing at 24 EFPY was received on August 21, 1996, via Reference 7. Therefore, no invessel surveillance data exist at this time.

A description of the proposed change and the associated justification (including a Basis For No Significant Hazards Consideration as per 10CFR50.91 and 50.92) are provided in Attachment 2. A marked-up copy of the affected pages from the current TS is provided in Attachment 3 along with the proposed set of replacement curves for TS Figure 3.4.11-1. A duplicate set of curves (of the replacement curves included in Attachment 3) has also been provided in Attachment 4 to

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Attachment 2

Evaluation of No Significant Hazards
Consideration for Request for Revision to the
Pressure-Temperature Curves (PCOL 96/10)
for
Grand Gulf Nuclear Station

DESCRIPTION of PROPOSED CHANGES and JUSTIFICATION:

In accordance with 10CFR50.90, the following changes to the GGNS Technical Specifications (TS) are being proposed with justification:

1. Revise TS Figure 3.4.11-1 since the curve is valid up to 10 Effective Full Power Years (EFPY). The proposed curves have been drawn for five different EFPY periods: 16, 20, 24, 28 and 32. The curves will be reflected as Figure 3.4.11-1 (pages 1 through 5). Two sets of curves have been provided. The first set of curves (Attachment 3) has information operations personnel need to operate the plant in accordance with TS Limiting Condition for Operation 3.4.11. This set of curves is proposed to replace the existing curve on TS Figure 3.4.11-1. The second set of curves (Attachment 4) are duplicates of the Attachment 3 curves with the exception that the curves contain detailed information used in development of the curves. Upon approval of the proposed curves for TS Figure 3.4.11-1, the set included in Attachment 4 will be included in the next update of the Updated Final Safety Analysis Report (UFSAR) for information. The Attachment 3 curves (containing operator information) will be included in the TS.

Justification:

The proposed and previously submitted curves were developed using the methodology of Regulatory Guide 1.99, Revision 2 and in accordance with 10CFR50, Appendix G. The following Adjusted Reference Temperatures (ARTs) were used in the calculations to produce the values for these curves:

| | |
|----------------|----------------------------|
| 10-16 EFPY ART | - 33.53 degrees Fahrenheit |
| 16-20 EFPY ART | - 40.77 degrees Fahrenheit |
| 20-24 EFPY ART | - 47.04 degrees Fahrenheit |
| 24-28 EFPY ART | - 52.59 degrees Fahrenheit |
| 28-32 EFPY ART | - 57.57 degrees Fahrenheit |

Other data to support the curves has previously been submitted to the NRC and are listed in the references section of this proposal. The curves being proposed are consistent with the previously submitted curves.

2. Revise TS Surveillance SR 3.4.11.1.a by addition of "the applicable" after "of" and "based on the current Effective Full Power Year (EFPY)" after "Figure 3.4.11-1". Revise TS Surveillance SR 3.4.11.2 by addition of "the applicable" after "in" and "based on the current Effective Full Power Year (EFPY)" after "Figure 3.4.11-1".

Justification:

These changes are needed to support the changes to TS Figure 3.4.11-1. This change will require that the current EFPY be verified prior to use of a curve to ensure proper application of the correct curve.

3. Revise TS Figure 3.4.11-1 label wording for Curve A label from "INSERVICE LEAK AND HYDROTEST" to "INSERVICE LEAK & HYDROSTATIC TESTING LIMIT".

Justification:

This change revises the curve labeling consistent with the terminology used in Table 1 of 10CFR50, Appendix G.

4. Revise TS Figure 3.4.11-1 label wording for Curve B label to delete the words "NON-NUCLEAR HEAT UP and COOLDOWN" by replacement with the words: "Core Not Critical".

Justification:

This change revises the curve labeling consistent with the terminology used in Table 1 of 10CFR50, Appendix G.

5. Revise TS Figure 3.4.11-1 label wording for Curve C label to delete: "NUCLEAR (CORE CRITICAL) HEAT UP & COOLDOWN" by replacement with the words: "Critical Core".

Justification:

This change revises the curve labeling consistent with the terminology used in Table 1 of 10CFR50, Appendix G.

6. Revise TS Figure 3.4.11-1 note "CURVES A, B & C ARE PREDICTED TO BE APPLICABLE FOR SERVICE PERIODS UP TO AND INCLUDING 10 EFPY". Each curve of the attached five curves will state the applicable EFPY period for which the curves are effective. The note listed above will be retained on each of the curves with the exception that "A, B & C" and are "predicted to be" will be deleted.

Justification:

Deletion of the words "A, B & C" from TS Figure 3.4.11-1 is an editorial change and does not remove the period for which all the curves are applicable. The curves are clearly labeled A, B, & C on the TS Figure 3.4.11-1 directly above each applicable curve line. The words "predicted to be" is not needed on the curves and does not add any value to the curves. The replacement wording clearly specifies the period for which each curve is applicable and does not change the meaning or intent of the previous words. Curve applicability will still be clearly specified on each curve showing the EFPY periods for which the curves are valid.

7. Revise TS Figure 3.4.11-1 notes to remove the following phrases:
- BOTTOM HEAD PENETRATION CONTROLLED
 - FEEDWATER NOZZLE CONTROLLED
 - BELTLINE CONTROLLED
 - CURVES B & C ARE BASED ON AN ART OF 25.76°F OF BELTLINE. CURVE 'A' IS NOT BELTLINE CONTROLLED.

Justification:

These phrases are not needed other than for review and validation of the graphs. Having the phrases on the TS curves distracts from the intended purpose which is to maintain operation to the right of the curves. Operators, in performance of their job function, do not need this information to comply with TS Limiting Condition for Operation (LCO) 3.4.11. The parameters that the operators monitor, to ensure the Reactor Coolant System Pressure and Temperature (P/T) Limits are not exceeded, are specified by the LCO. A duplicate set of curves, containing the detailed information used in development of the TS curves will be retained in the UFSAR as information and are included in Attachment 4.

8. Revise TS Figure 3.4.11-1 note "BOLT UP LIMIT 70°F" by relocating "70° F" to the graph directly below the curve line. Also, the degree symbol "°" is being replaced with the word "Degree" on the RPV Metal Temperature scaling.

Justification:

This is an editorial change and only a relocation of information to a more appropriate location on graph (the scaling). The bolt up limit of 70°F will still be clearly annotated on the graph scaling and by a bold line drawn vertically up the 70°F graph line. The replacement of the degree symbol with words ensures that the curve is clearly understood.

9. Revise TS Figure 3.4.11-1 by removal of "100°F, 130°F, 170°F" from the graph area.

Justification:

This is an editorial change since these limits are still clearly annotated on the graph scaling. Removal of information from the graph area allows easier plotting of data.

10. Revise page number for Technical Specification Section 3.4.12, Reactor Steam Dome Pressure from 3.4-32 to 3.4-36.

Justification:

This is an editorial change and is necessary to support the additional pages added to TS Figure 3.4.11-1.

The proposed TS changes are reflected on a marked-up copy of the affected pages from the GGNS TS in Attachment 3. The proposed replacement pages for the existing TS Figure 3.4.11-1 pressure-temperature limit curve are also included in Attachment 3. Another duplicate set of curves containing detailed information used in development of the TS curves are also included in Attachment 4. In addition to these changes, the changes to the GGNS TS Bases have been provided in Attachment 5. The GGNS TS Bases changes are consistent with the proposed TS changes and are included to facilitate NRC review.

REFERENCES

1. AECM-89/0047, Generic Letter 88-11, "NRC Position on Radiation Embrittlement of Reactor Vessel Materials and Its Impact on Plant Operations", Updated Information, from EOI to NRC, dated February 28, 1989.
2. AECM-89/0189, Response to Request for Additional Information Regarding Generic Letter 88-11, from EOI to NRC, dated October 13, 1989.
3. AECM-90/0048, Pressure-Temperature Limits Proposed Amendment to the Operating License (PCOL-90/06) from EOI to NRC, dated April 26, 1990.
4. Response to Request for Additional Information, from EOI to NRC, dated November 30, 1990.
5. GNRO-96/00035, Request for Revision to the Reactor Vessel Material Surveillance Program Schedule, from EOI to NRC, dated May 2, 1996.
6. "Surveillance Specimen program Evaluation for Grand Gulf Nuclear Station", GE Nuclear Energy, GE-NE-B1301807-01R1 April 1996, (included with GNRO-96/00035).
7. GNRI-96/00176, Issuance of Amendment No. 127 to the Facility Operating License No. NPF-29 - Grand Gulf Nuclear Station, (revised withdrawal schedule for incore specimen capsules), Letter and SER from NRC to EOI dated August 21, 1996.

NO SIGNIFICANT HAZARDS CONSIDERATION for PCOL 96-10

The Commission has provided standards for determining whether a no significant hazards consideration exists as stated in 10CFR50.92(c). A proposed change involves no significant hazards consideration if operation of the facility in accordance with the proposed change would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

Entergy Operations, Inc. has evaluated the no significant hazards consideration in its request for a change to Pressure/Temperature Limit curves and determined that no significant hazards consideration results from this change. In accordance with 10CFR50.91(a), Entergy Operations, Inc. is providing the following analysis of the proposed changes against the three standards in 10CFR50.92(c):

- A) **The proposed change does not significantly increase the probability or consequences of an accident previously evaluated.**

Regulatory Guide 1.99, Revision 2 is currently used to prepare the pressure-temperature limit curves and is inherently conservative for Boiling Water Reactors (BWRs). The proposed Technical Specification Figure 3.4.11-1 was prepared in accordance with the requirements of 10CFR50, Appendix G and using NRC approved methodology outlined in NRC, Regulatory Guide 1.99, Revision 2 "Radiation Embrittlement of Reactor Vessel Materials." Operation of the plant within the limitations of the proposed figure will ensure that the Requirements of 10CFR50, Appendix G are met up to and including 32 Effective Full Power Years (EFPY) of operation. The proposed changes assure that the existing safety limits are not exceeded due to changing Reactor Vessel conditions by continued incorporation of the effect of neutron radiation embrittlement of vessel materials into the proposed curves.

The curves have also been editorially enhanced by removal of phrases used for validation of the curves. Having the phrases on the TS (Technical Specification) curves distracts from the intended purpose which is to maintain operation of the reactor to the right of the curves. Operators, in performance of their job function, do not need this information to comply with TS Limiting Condition for Operation (LCO) 3.4.11. This change also revises the curve labeling consistent with the terminology used in Table 1 of 10CFR50, Appendix G. These enhancements and revisions have no impact on the operation of the plant since they are editorial in nature and do not change the technical content of the curves.

Therefore, the proposed change does not significantly increase the probability or consequences of an accident previously evaluated.

- B) **The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The pressure-temperature curves are controlled by the Technical Specifications and are determined using the conservative methodology in NRC Regulatory Guide 1.99, Revision 2 "Radiation Embrittlement of Reactor Vessel Materials." The proposed pressure-temperature limit curves are inherently conservative, therefore, the possibility of failure of the reactor vessel is not increased. The proposed curves establish new periods of applicability (16, 20, 24, 28, and 32 EFPY) for the current pressure-temperature limitations based on NRC methodology in Regulatory Guide 1.99 and actual fluence measurements. These limitations are appropriate up to and including 32 EFPY exposure and operation of the plant within the figure's limitations will ensure that the requirements of 10CFR50, Appendix G are met for that time frame. No physical plant modifications or new operating configurations result from these changes. These changes do not adversely affect the design or operation of any system or component important to safety, rather they establish limits to assure that operations remain within acceptable safety boundaries.

The curves have also been editorially enhanced by removal of phrases used for validation of the curves. Having the phrases on the TS curves distracts from the intended purpose which is to maintain operation of the reactor to the right of the curves. Operators, in performance of their job function, do not need this information to comply with TS Limiting Condition for Operation (LCO) 3.4.11. This change also revises the curve labeling consistent with the terminology used in Table 1 of 10CFR50, Appendix G. These enhancements and revisions have no impact on the operation of the plant since they are editorial in nature and do not change the technical content of the curves.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

- C) **The proposed change does not involve a significant reduction in a margin of safety.**

The proposed curves were developed using the methodology of Regulatory Guide 1.99, Revision 2 "Radiation Embrittlement of Reactor Vessel Materials." This methodology includes an allowance for margin that is to be included in the upper-bound values of the adjusted reference temperature (ART). The proposed changes maintain the existing margins of safety by modifying the operating limits based on the most limiting of the actual reference temperature shifts. These new limits consider the most limiting pressure vessel material. The revised analysis demonstrates that the existing Technical Specification pressure-temperature limit curves are applicable for periods of 16, 20, 24, 28, and 32 EFPY. Using the methodology in NRC Regulatory Guide 1.99 Revision 2 and fluence based on actual exposure provides for additional

conservatism, and therefore further assures the existence of current margins of safety. The proposed pressure-temperature limit curves are inherently conservative and provide sufficient margin to ensure the integrity of the reactor vessel.

The curves have also been editorially enhanced by removal of phrases used for validation of the curves. Having the phrases on the TS curves distracts from the intended purpose which is to maintain operation of the reactor to the right of the curves. Operators, in performance of their job function, do not need this information to comply with TS Limiting Condition for Operation (LCO) 3.4.11. This change also revises the curve labeling consistent with the terminology used in Table 1 of 10CFR50, Appendix G. These enhancements and revisions have no impact on the operation of the plant since they are editorial in nature and do not change the technical content of the curves.

Continuing commitment to the methodology contained in NRC Regulatory Guide 1.99, Rev. 2 will ensure that the most limiting plate or beltline weld material will be utilized in the determination of the pressure-temperature limits for any future curve changes.

Therefore, the proposed change does not result in a significant reduction in a margin of safety.

Based on the above evaluation, Entergy Operations, Inc. has concluded that operation in accordance with the proposed change involves no significant hazards consideration.