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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29

Generic Letter (GL) 96-06, Action Plan for Resolution

GNRO-99/00083

Gentlemen:

In response to GL 96-06 Grand Gulf Nuclear Station (GGNS) committed to take appropriate action to resolve the nonconforming condition for each Containment/Drywell penetration, determined to be susceptible to overpressurization due to thermal expansion of fluid. Entergy's expectation was to resolve this issue prior to startup from refueling outage number ten (RFO10) which was the earliest available refueling outage where Design and Procurement requirements could be satisfied. As Grand Gulf moved forward to meet its commitment, it became apparent that additional time would be required to complete the evaluation and corrective measures determination.

Attachment 1 contains a listing of known penetrations affected by the GL 96-06 issue. This list is divided into three groupings with a brief summary of the proposed resolution for each penetration. This attachment also provides the expected schedule for resolution of all penetrations affected by this issue.

Attachment 2 to this letter provides a detailed chronology of the scope increase and explanation as to the necessity for the additional time. The attachment also provides justification for the continued operability of the penetrations being delayed until RFO11.

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Please fill free to contact Dana E. Smith at (601)437-6434 should you have any questions or require additional information.

Yours truly,

LFD/JCR
attachments: 1. List of Valves Affected By GL 96-06
2. GL 96-06 Scope Increase

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# List of Valves Affected By GL 96-06

| Penetration Number | Boundary Valves | Modification Summary |
|---|---|---|
| Initial Group of Penetrations (ER 97/00022-00 & ER 97/0022-01) | | |
| 36 | P72F122 & P72F123 | Drill one disk of Q1P72F123, Add relief valve on HBD piping & replace bolts on Q1P72F122 |
| 39 | P71F148 & P71F149 | Drill one disk of Q1P71F149, Add rupture disc on JBD piping & replace bolts on Q1P71F148 |
| 43 | G33F028 & G33F034 | No modification required |
| 47 | B33F127 & B33F128 | No modification required |
| 49 | G36F106 & G36F101 | Drill one disk of Q1G36F106, Add rupture disc on HBD piping & replace bolts on Q1G36F101 |
| 50 | P45F068 & P45F067 | Implement valve closure timing after receipt of approved Operating License Amendment requested on October 7, 1999 in GNRO-99/00077 |
| 51 | P45F061 & P45F062 | Implement valve closure timing after receipt of approved Operating License Amendment requested on October 7, 1999 in GNRO-99/00077 |
| 54 | G41F201 & G41F053 | No modification required |
| 58 | G41F029 & G41F044 | Replace bolts on Q1G41F029 & Q1G41F044 |
| 81 | B33F125 & B33F126 | No modification required |
| 84 | P45F098 & P45F099 | Replace bolts on Q1P45F098 & Q1P45F099 |
| 86 | P21F018 & P21F017 | No modification required |
| 330 | P42F116 &P42F117 | No modification required |
| 331 | P72F125 & P72F126 | Drill both disks of Q1P72F126 |
| 333 | B33F205 & B33F206 | Revise Operation's procedure to require draining prior to isolation |
| 348 | P45F009 & P45F010 | Drill both disks of Q1P45F010, add rupture disc on HBD piping |
| 349 | P45F003 & P45F004 | Drill both disks of Q1P45F004, add rupture disc on HBD piping |
| 364 | P45F096 & P45F097 | Drill globe valve disk of Q1P45F097, add rupture disc on HCD piping |

# List of Valves Affected By GL 96-06

| Penetration Number | Boundary Valves | Modification Summary |
|---|---|---|
| Initial Group (CR 1997-0059) | | |
| **50 | P45F066 & P45F067 | Deferred till RFO11 |
| **51 | P45F061 & P45F062 | Deferred till RFO11 |
| First Additional Group (CR 1999 – 1147) | | |
| 38 | P71F150 & P71F151 | Deferred till RF011 |
| 56 | P11F075 & P11F004 | Deferred till RF011 |
| 87 & 325 | G33F001, G33F004 & G33F252 | Deferred till RF011 |
| 88 | G33F053 & G33F054 | Deferred till RF011 |
| * 330 | P42F116 & P42F117 | Deferred till RF011 |
| 366 | G33F252 & G33F253 | Deferred till RF011 |
| 465 | B33F019 & B33F020 | Deferred till RF011 |
| Second Additional Group (CR 1999 – 1256) | | |
| 18 / E12 | E12F394 & E12F019 | Deferred till RF011 |
| 19 / B21 | B21F016 & B21F019 | Deferred till RF011 |
| * 43 / G33 | G33F028 & G33F034 | Deferred till RF011 |
| 44 / P42 | P42F035 & P42F066 | Deferred till RF011 |
| 45 / P42 | P42F067 & P42F068 | Deferred till RF011 |
| * 54 / G41 | G41F201 & G41F053 | Deferred till RF011 |
| * 86 / P21 | P21F018 & P21F017 | Deferred till RF011 |
| 90 / P41 | P41F168A & P41F160A | Deferred till RF011 |
| 91 / P41 | P41F168B & P41F160B | Deferred till RF011 |
| 311 / E12 | E12F394 & E12F019 | Deferred till RF011 |
| 312 / B21 | B21F016 & B21F019 | Deferred till RF011 |
| 329 / P42 | P42F115 & P42F114 | Deferred till RF011 |

* Previously included in the initial group of eighteen penetrations. But dispositioned no modification required.
**Previously included in the initial group but deferral required due to awaiting approval of Operating License Amendment requested in GNRO-99/00077.

## GL 96-06 Scope Increase

NRC Generic Letter 96-06, Assurance of Equipment Operability and Containment Integrity During Design Basis Accident Conditions, was issued on September 20, 1996. Grand Gulf's initial response (GNRO 96/00122) was submitted on October 29, 1996 and informed the NRC we intended to determine if piping systems that penetrate the containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur. We also committed to submitting a written summary report stating actions taken in response to the requested actions, conclusions that were reached relative to overpressurization of piping that penetrates containment, the basis for continued operability of affected systems and components as applicable, and corrective actions that were implemented or planned to be implemented.

On January 28, 1997 Grand Gulf submitted its 120 day response to GL 96-06 via GRNO 97-00011. The submittal provided the results of an engineering evaluation of containment/drywell penetrations that could be susceptible to overpressurization due to thermal expansion of fluid. The evaluation identified twelve containment and 6 drywell penetrations potentially susceptible to thermal overpressurization. For each of these 18 penetrations Grand Gulf committed to implement appropriate corrective action to restore the nonconforming condition to within allowed limits prior to restart from RF09.

On September 15, 1997 Grand Gulf received a request for additional information related to GL 96-06 (Ref. GNRI 97/00149). The request stated, "To permit the staff to continue its review of your submittals, we request that you provide the following information: (1) summaries of the evaluations of the eighteen piping lines penetrating the containment and drywell, (2) the summaries should describe the method of analysis, including the assumptions used, and the results, (3) fabrication drawings of the piping sections evaluated, (4) a discussion on how the criteria used for the evaluations meet the licensing basis criteria for Grand Gulf Nuclear Station, Unit 1, and (5) the schedule for completion of any modifications that are required."

Grand Gulf submitted a change in scheduled corrective actions to GL96-06 via GNRO 97/00106, dated November 4, 1997. Based on the low level of safety significance this nonconformance imposes, the pending ASME Code Case, the information from the EPRI testing, and the potential increase in safety system challenges resulting from physical modifications it was prudent to establish a corrective action schedule to allow appropriate evaluation of all options. With this approach, resolution of the nonconforming condition was expected to be completed prior to the restart from RFO10.

On November 20, 1997 Grand Gulf submitted its response (GNRO 97/00114) to the RAI, dated September 15, 1997. This submittal contained a copy of Engineering report GGNS-97-0002, Rev 0. This report contains an engineering evaluation of the Drywell Cooling/Chilled Water System and penetration overpressurization, screening criteria to identify drywell and containment penetrations potentially susceptible to overpressurization due to trapped fluid, results of all drywell and containment penetration screenings including explanations, and the maximum expected delta-t results for each of the susceptible penetrations. We also reiterated that this nonconforming condition was expected to be completed prior to the restart from RFO10.

Grand Gulf has provided two additional submittals, GNRO 99/00046, dated June 9, 1999, and GNRO 99/00059, dated August 3, 1999. GNRO 99/00046 provided summaries of the

Grand Gulf has provided two additional submittals, GNRO 99/00046, dated June 9, 1999, and GNRO 99/00059, dated August 3, 1999. GNRO 99/00046 provided summaries of the eighteen penetrations that were potentially susceptible to overpressurization and the planned resolution for each of them. GNRO 99/00059 provided an example of the piping analysis being performed for eight penetrations identified as being acceptable per analysis.

In each of these submittals, we committed that the eighteen identified penetrations will be restored to conformance with the licensing requirements prior to restart from RFO10 (now scheduled for fall 1999).

Grand Gulf was preparing the design modification packages to resolve these identified eighteen penetrations with the issue for construction date (IFC) set for September 16, 1999. During the technical panel review of the modification packages several days before their scheduled IFC date, questions were raised concerning the effects of adjacent non-safety related piping on the containment/drywell isolation valves and the application of single failure criteria in the design. It became apparent that for those penetration configurations requiring physical modifications the design appropriately addressed these conditions. However, for the evaluations performed that resulted in no physical modifications, the evaluation was focussed only on the penetration piping up to and including its associated isolation valves. These evaluations had not considered effects of adjacent non-safety related piping and application of single failure criteria. An additional question was posed as to the last time Engineering Report GGNS-97-0002, Rev 0 had been reviewed for technical content (including proper consideration for effects of adjacent non-safety related piping and application of single failure criteria) since this report was the basis for the eighteen penetrations and was issued in January, 1997. The response was that it had not been reviewed since its issuance and the key individuals involved no longer worked at Grand Gulf. From this meeting an action was taken to review the evaluations which screened penetrations from requiring modifications and to revalidate the engineering report.

The revalidation effort was completed on October 15, 1999. During this revalidation effort it was determined that 4 of the original eighteen penetrations that were evaluated as not requiring modification fell out as now requiring modification and an additional 16 penetrations were identified as susceptible and require further evaluation. It appears that when the initial report was written in 1997 the focus of the engineers involved was on the penetration piping up to and including its associated isolation valves. This focus was carried through by the engineers in 1999 when initially evaluating how many of the eighteen penetrations required physical modifications. However, after the initial evaluations screened out those not requiring modifications, the remaining penetrations were evaluated considering all the screening criteria with the piping system as a whole and not just the penetration piping up to and including its associated isolation valves.

Grand Gulf is confident that consideration of the broader effects of accident conditions on containment and drywell piping should be evaluated. Therefore, we now have four of the original eighteen penetrations and sixteen additional penetrations that need further evaluations to resolve the containment/ drywell piping penetration issues. Additionally, two of the original eighteen penetrations are held up pending approval of the License Amendment requested on October 7, 1999 in GNRO-99/00077 for revised source term. The resolution of these two penetrations will require changing the stroke time for the appropriate valves.

Due to the late identification of these twenty penetration issues and RFO10 beginning on October 23, 1999, their resolution together with the two penetrations awaiting License Amendment approval, must be extended to RF011. This additional time is needed to allow adequate time to develop the most appropriate design resolution, perform walkdowns in RFO10 of systems located in areas inaccessible during plant operations, and develop specifications and procure needed parts to support any modifications. However we do intend to complete all modifications associated with twelve of the eighteen penetrations originally identified and submitted to the NRC via GRNO 97-00011 on January 28, 1997.

The remaining twenty-two penetrations have been evaluated for the ability to perform their safety related containment/drywell isolation function. This evaluation is in accordance with the guidance found in GL 91-18 and therefore continued operation is justified. Prior to restart from RF011 (now scheduled for spring 2001) appropriate corrective action will be implemented for each of the twenty-two penetrations to restore the nonconforming condition to within allowed limits.

A simplified elastic plus plastic analysis was performed on straight sections of penetration piping. The calculations determined the general primary membrane stress intensity by balancing the mechanical deformation of the pipe with the thermodynamic equilibrium of the water isolated within the pipe at the predicted maximum temperature in the piping sections. The primary membrane stress levels for all penetration piping except penetrations 366 and 88 were less than the limits of Appendix F. The strain calculated for any of the penetrations including penetration 366 and 88 is less than 2%. Based upon the calculated stresses meeting the limits of Appendix F and the calculated strains in the piping being less than 2% the piping integrity is maintained.

In accordance with GL 91-18, the nonconforming condition was documented within the corrective action program and a prompt determination of operability was documented for each affected penetration. Following assurance that containment integrity would be maintained (i.e. no safety concern exists), the nonconforming condition was evaluated for potential reportability requirements. In this instance the reportability determination was contingent on the interpretation of the phrase "outside the design basis of the plant". GGNS believes guidance provided for making this interpretation directs one to focus on preservation of defense in-depth particularly as it relates to fission product barriers.

In this case since all affected containment/drywell penetrations retain their ability to perform their safety function and thus containment integrity is maintained, this nonconforming condition is not considered reportable under the criteria of 10CFR 50.72. As with other nonconforming conditions, appropriate corrective action to restore the condition to within the required quality requirements will be taken in accordance with the safety significance of the issue.