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March 2, 2001

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
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Subject: Entergy Operations, Inc.
Request for Relief from 10CFR50.55a Examination Requirements

Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29

CNRO-2001-00010

On December 19, 2000, Entergy Operations, Inc., (Entergy) submitted ASME Relief Request GG-ISI-001, Rev. 0 for its Grand Gulf Nuclear Station (GGNS).[1] By this submittal, Entergy requested that the NRC authorize relief from the inservice inspection requirements of 10CFR50.55a(g) for the volumetric examination of circumferential reactor pressure vessel welds in accordance with the guidance provided in Generic Letter (GL) 98-05, "Boiling Water Reactor Licensees use of the BWRVIP-05 Report to Request Relief from Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds."

In a recent telephone conference call, the NRC staff requested that Entergy provide further information pertaining to high-energy line examinations and inspection history. A revised request GG-ISI-001, Rev. 0, which provides the requested information, is attached. This revised request replaces the previously submitted request in its entirety.

Entergy requests the NRC approve GG-ISI-001 prior to the beginning of the upcoming spring refueling outage at GGNS, which is scheduled to begin April 13, 2001.

This letter contains no commitments.

[1] Letter No. CNRO-2000-00037, dated December 19, 2000, "Request for Relief from 10CFR50.55a Examination Requirements"

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Should you have any questions regarding this submittal, please contact Guy Davant at (601) 368-5756.

Very truly yours,

M. A. Krupa

MAK/GHD/baa
attachment
cc: Mr. W. A. Eaton (GGNS)
Mr. G. R. Taylor (ECH)

Mr. T. L. Hoeg, NRC Senior Resident Inspector (GGNS)
Mr. E. W. Merschoff, NRC Region IV Regional Administrator
Mr. S. P. Sekerak, NRC Project Manager (GGNS)

REQUEST FOR RELIEF
GG-ISI-001, Rev. 0

Components/Numbers:	See Table 1 below
Code Classes:	1
References:	ASME Section XI, 1992 Edition, Table IWB-2500-1
Examination Category:	B-J
Item Number:	B9.11 and B9.21
Description:	Examination of piping welds inside containment penetrations
Unit / Inspection Interval Applicability:	Grand Gulf Nuclear Station – second (2^{nd}) 10-year interval

I. Code Requirement(s)

ASME Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.11 requires a surface examination and a volumetric examination on all piping welds as defined by Figure IWB-2500-8. Item B9.21 requires a surface examination of the weld as defined by Figure IWB-2500-8.

II. Code Requirement from Which Relief is Requested

Pursuant to 10CFR50.55a(g)(5)(iii), Entergy Operations, Inc. (Entergy) requests relief from performing Code-required surface and volumetric examinations on the circumferential welds listed in Table 1, below. Entergy has determined that conformance with certain Code requirements is impractical. Entergy requests that the NRC evaluate these determinations and grant the requested relief in accordance with 10CFR50.55a(g)(6)(i).

III. Basis for Relief

The high-energy piping that penetrates the containment was designed as a flued head-type penetration that includes a guard pipe similar in design to Figure 1, below. Additionally, these penetrations were designed such that the penetrations are anchored to the containment building. Fins are provided for cooling.

These lines are designed to 575°F and a pressure ranging from 1060 to 1180 psig depending on application. The process pipe is either ASME SA 155 KCF 70, ASME 106 Grade B, or ASME SA 106 Grade C. Guard pipes are ASME SA 155 KCF 70, ASME SA 106 Grade B, or ASME SA 105.

ASME Section III (1974 with Summer 1975 Addenda and 1980 Edition for General Electric piping and 1974 Edition and Summer Addenda through Summer 1975 Addenda for Bechtel-supplied piping) was used for the design of the flued head and guard pipe. The process pipe was also designed to ASME Section III, Subsection NB 1974 Edition with Summer 1975 Addenda.

The circumferential welds for which relief is requested are composed of carbon steel. As such, in a typical BWR environment they are not susceptible to stress corrosion cracking. Design fatigue cumulative usage factors (CUF) for the subject welds are less than 0.1. Therefore, the potential to develop fatigue cracks is extremely low (see the stress analysis review discussion below). Other potential failure mechanisms [e.g., general corrosion, pitting, flow-accelerated corrosion (FAC), etc.] are also considered low probability events, based upon both the operating parameters of the systems and the fact that inservice inspection (ISI) of other welds in these systems has shown no evidence of service-related degradation to date. In addition, any leakage would return to the drywell, leading to an increase in the unidentified leak rate and an increase in the drywell temperature.

Pre-service inspection (PSI) and ISI of these welds, as described in Table 1, have detected no relevant surface indications and no recordable volumetric indications. Should the conditions in the systems change, examination of the remaining welds in the systems will likely detect the onset of service-related degradation.

Each of the lines identified in Table 1 has a pressure-retaining circumferential weld that was previously accessible for partial examination via an inspection port included in the penetration. The original design of these access ports included bolted gasketed covers that required the performance of periodic local leak rate tests (LLRTs). These covers had a history of LLRT failures (approximately 25% failure rate). Therefore, the access ports were welded closed to provide assurance of minimal leakage. Thus, the Code-required examinations would require removing the access port welds to gain access to the process pipe welds and re-welding the covers following the examinations. A personnel exposure of approximately 24 Rem would be expected to complete the limited Code-required examinations of these welds over the interval. Even after this level of effort of opening the access ports, the extent of weld examination is limited because of space restrictions between the guard pipe and the process pipe, as listed in Table 1.

Furthermore, nine of the welds identified in Table 1 are included in the MEB 3-1 High-Energy Line population. The High-Energy Line population consists of 365 welds of which 301 are represented in the systems affected by this relief request. Therefore, nine of the subject examinations are being eliminated from a population where 100% of the welds in the high-energy pipe boundary are examined unless specific relief has been granted by the NRC. The other two welds for which relief is requested are contained in portions of piping systems that are examined at a Code-required sample size of 25% of the total nonexempt population. This request for relief does not reduce the examination population below 25%.

In addition, leakage was postulated to occur from cracks initiated in these lines originating from a size equal to the process pipe cross section (non-mechanistic). The guard pipe design provides for leakage return to the drywell, which is designed for such an event. Additionally, the guard pipes are designed for the process pipe design conditions, as stated above.

The process pipes were tested to the required ASME Code hydrostatic test pressure while the guard pipes were tested to the process pipe operating pressure conditions.

Entergy has performed a stress analysis and a risk analysis of this relief request. These topics are discussed below.

- Stress Analysis Review

  Entergy has performed a review of the various stress analyses to determine both the state of stress and the cumulative fatigue usage (design) for the welds in question. The design requirements for these lines inside the penetrations required that either:

  1) The maximum stress range as calculated using equation (10) of ASME Section III NB-3653 not exceed 2.4 S_m and the CUF must be less than 0.1, or

  2) The stress range calculated using equation (12) or (13) of the Code not exceed 2.4 S_m

  Review of calculations and revisions thereto performed by General Electric and Bechtel show that both of these criteria were met and that the usage factors never approached 0.1. Therefore, the likelihood of a pipe break in non-IGSCC sensitive materials makes the probability of failure extremely remote. In addition, any leakage would return to the drywell leading to an increase in the unidentified leak rate and an increase in the drywell temperature.

- Risk Discussion

  The upper bound core damage frequency (CDF) increase associated with the relief from inspections of specific welds is equal to 4.31E-07 per year, which is considered "non-risk significant". This conclusion is based on the *EPRI PSA Applications Guide* for permanent facility changes. This is a bounding value, which is conservative.

A more realistic estimate of the CDF increase due to the weld inspection interval change is 3.23E-08 per year. This increase corresponds to approximately less than a 1% increase in the total CDF. The large early release frequency (LERF) increase due to the proposed change is also insignificant since the change impacts welds inside the primary containment.

In conclusion, the proposed relief from inspection of specific welds does not significantly increase the total CDF or LERF.

IV. Proposed Alternative Examinations

The welds identified in Table 1 will continue to be subjected to ASME Section XI leakage tests in accordance with ASME Section XI or NRC-approved Code Cases.

V. Conclusion

10CFR50.55a(g)(5)(iii) states:

"If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in 50.4, information to support the determinations."

Entergy believes that requiring the access ports to be cut open and then re-welded to perform partial examinations of piping welds in portions of systems that are already rigorously examined is an impracticality. Additionally, if performing the examinations to meet the Code were required, significant burden would be assumed in modifying the access ports to allow for repeated access. Based on previous attempts to secure a mechanically connected access port, Entergy expects that the containment boundary would be returned to a condition susceptible to excessive leakage. Therefore, we request the proposed request for relief be authorized pursuant to 10CFR50.55a(g)(6)(i).

Table 1

System	Penetration Weld	Line No.	Size	MEB 3-1 High Energy	Total No. of MEB 3-1 welds in System	Preservice History	Inservice History	% Coverage if Examined Volume/Surface
Feedwater A	1B21G026-W2	DBA-013	24"	Yes	51	See Note 1	See Note 3	24/13
Feedwater B	1B26G026-W18	DBA-013	24"	Yes		See Note 1	See Note 3	24/29
Main Steam A	1B21G12-A1-A	MSA-003	28"	Yes	101	See Note 2	See Note 3	27/27
Main Steam B	1B21G12-B1-A	MSA-003	28"	Yes		See Note 2	See Note 3	23/20
Main Steam C	1B21G12-C1-A	MSA-003	28"	Yes		See Note 2	See Note 3	32/18
Main Steam D	1B21G12-D1-A	MSA-003	28"	Yes		See Note 2	See Note 3	23/20
RWCU	1G33G002-W18	DBA-009	6"	Yes	100	See Note 1	See Note 3	58/56
RCIC Steam Inlet	1E51G004-W7	DBA-024	10"	Yes	39	See Note 1	See Note 3	100/35
RHR/RCIC Head Spray	1E51G001-W12	DBA-030	6"	No	N/A	See Note 1	See Note 4	50/50 Estimated
RHR Pump Suction	1E12G012-W47	DBA-064	20"	No	N/A	See Note 1	See Note 3	19/19
Main Steam Drain	1B21G021-W9	DBA-023	3"	Yes	10	See Note 1	See Note 5	N/A/100

Table 1 Notes

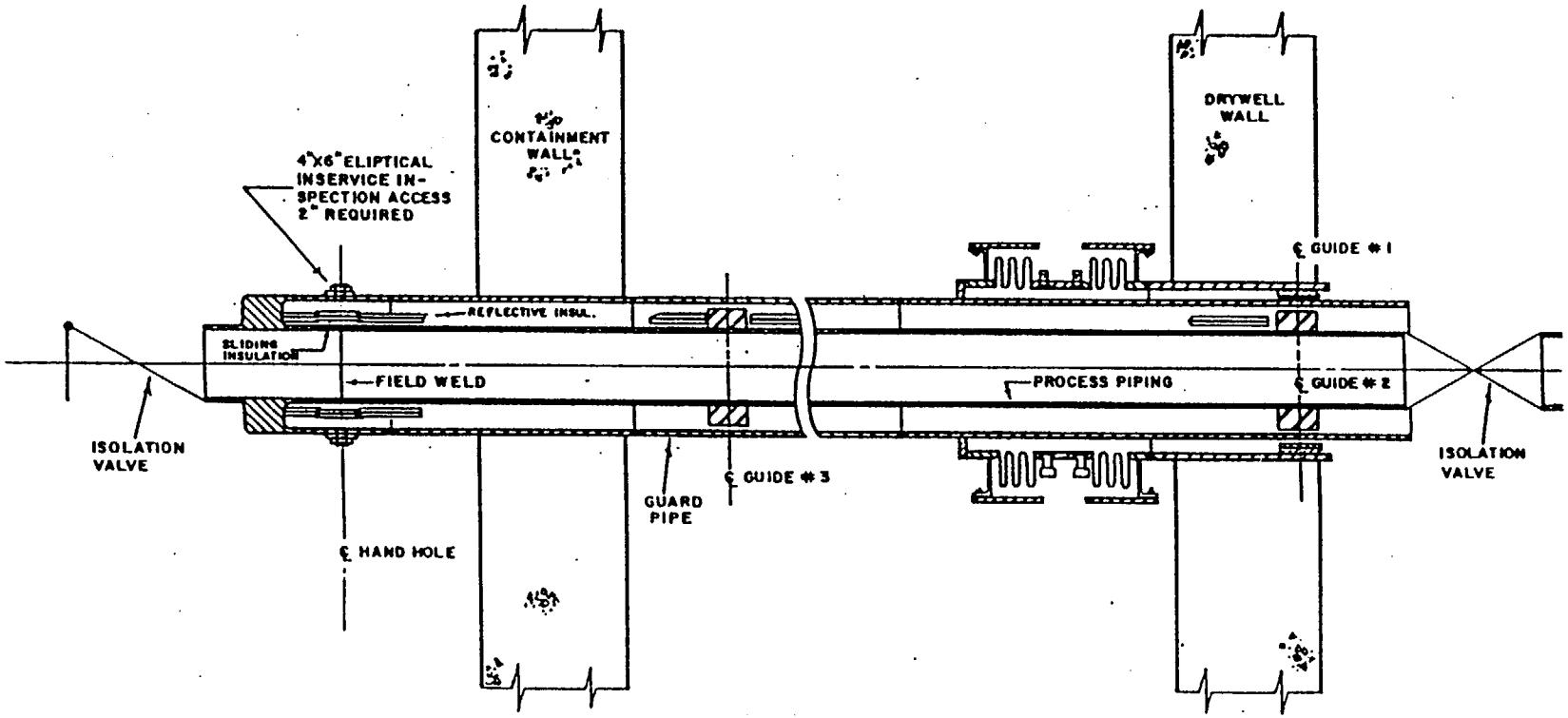
Note 1: This weld was ultrasonically examined for its complete volume before installing the flued head and pipe assembly into the penetration.

Note 2: Ultrasonic examination was performed on this weld after the flued head and pipe assembly was installed in the penetration resulting in limited coverage. The limited coverage was recorded in Preservice Relief Request No. 000001.

Note 3: This weld was included as part of the 1st Interval ISI Program and because of limited coverage it was identified in Relief Request I-00007, Revision 2.

Note 4: This weld was included as part of the 1st Interval ISI Program and was identified in Relief Request I-00007, Revision 0 and was subsequently removed in Revision 2 because Code-required coverage was believed to be obtainable. Because this weld was not a mandatory selection in accordance with the Edition/Addenda applicable to the 1st interval, this weld was later replaced with a weld of easier access and lower dose. However, because of changes in the Code Edition/Addenda applicable to the current interval, this weld is now a mandatory selection.

Note 5: This weld was included as part of the 1st Interval ISI Program and was identified in Relief Request I-00007, Revision 0 and was subsequently removed in Revision 1 because Code-required coverage was obtainable.



VERTICAL SECTION THRU-GUARD PIPE ASSEMBLY

GRAND GULF NUCLEAR STATION

FIGURE 1