



MISSISSIPPI POWER & LIGHT COMPANY

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October 31, 1985

NUCLEAR LICENSING & SAFETY DEPARTMENT

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Additional Information on
the 10 Year Inservice
Inspection Program
AECM-85/0349

Mississippi Power and Light (MP&L) submitted the 10 Year Inservice Inspection Program by AECM-84/0371 dated July 25, 1984. By letter AECM-84/0470 dated September 20, 1984, MP&L requested relief from certain requirements of Section XI of the ASME Code. This submittal is provided in response to a request from your staff for additional information dated August 22, 1985.

As discussed with the NRC during the review of the Grand Gulf Nuclear Station (GGNS) Pump and Valve Inservice Testing Program, inservice plans in general are periodically updated to reflect the latest "as-built" conditions. After the NRC completes this review of the GGNS Inservice Inspection (ISI) program, future updates will be submitted to the NRC Region II to keep the inspection personnel current of the latest plant and program status. This is consistent with NRC direction given concerning the testing program.

MP&L's responses are provided in the attached. Where the response acknowledges a change to the 10-year program, copies of the changed page(s) are provided. These changes will be incorporated into the program by revision prior to MP&L's first refueling outage. This is consistent with MP&L's plans and schedule for an "as-built" of the 10-year program plan prior to refueling outages.

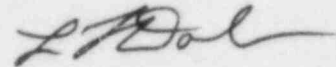
MP&L requests your review and approval of the ISI program be provided by March 2, 1986. This will enable MP&L to implement an accepted plan during the GGNS initial refueling outage, currently scheduled to begin in June, 1986.

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If you have any questions or require further information, please contact this office.

Yours truly,



L. F. Dale
Director

GCS/MLC/JGC:pas
Attachment

cc: Mr. J. B. Richard (w/a)
Mr. O. D. Kingsley, Jr. (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. H. L. Thomas (w/o)
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MP&L'S RESPONSE TO
NRC LETTER OF AUGUST 22, 1985

1) NRC COMMENT

Section 1, Foreword, Page 2

Section 1 states "The Grand Gulf Nuclear Station Unit 1 has utilized a unique plan for the inservice inspection of pipe supports other than snubbers. This sampling plan was transmitted to NRC by letter AECM-84/0257 dated May 11, 1984." The proposed sampling plan for pipe supports is also described in Section 7 of the GGNS ISI plan. This plan is being reviewed by the staff as an alternative program to be used in lieu of the IWF Code requirements.

As presented in letter AECM-84/0257 and Section 7, the proposed GGNS sampling plan would provide inservice inspection of pipe supports (other than snubbers) based on a statistically selected subset of the supports. MP&L proposes that the sampling plan will provide 95 percent confidence that a support population which contains 10 per cent or more defective supports will be identified and evaluated. In addition, the Class 2 and Class 3 supports are combined in the proposed GGNS plan, and an inspection sample is selected from the combined group on the basis that the design criteria for the Class 2 and 3 supports are the same. While the ASME Code Committee is considering proposals for statistical sampling methods and the concept of combining Class 2 and 3 supports, these methods are not at present in Section XI. Statistical sampling has been used in technical specifications for the functional testing of snubbers.

The GGNS plan is based on ASME Section XI, 1977 Edition with Addenda through Summer 1979. Section IWF-2510 of this Addenda of the Code requires that:

- (a) component supports selected for examination shall be the supports of those components that are required to be examined under IWB, IWC, and IWD during the first inspection interval;
- (b) for multiple components within a system of similar design, function, and service, the supports of only one of the multiple components are required to be examined.

Pressure retaining piping is included as a component in accordance with IWA-1300. Exclusions for IWF are identified in the Code as "In the course of preparation." Those exclusions applicable to components under IWB, IWC, and IWD can be included in the selection of piping supports for examination.

The staff cannot determine that the extent of examination and sample size proposed in the GGNS ISI plan is equivalent or superior to requirements of the applicable Addenda of the Code. The staff interprets the requirements of IWF to include the following:

- (a) The exclusions contained in IWB-1220, IWC-1220, and IWD-1230 may be applied in the selection of component supports for examination (Reference IWF-2510(a)).
- (b) For Class 1, 2, and 3 components, the supports in a "single loop" may be selected for examination. The supports of only one of multiple components, such as pumps and valves, within a system of similar design, function, and service are required to be examined (Reference IWF-2510(b)).
- (c) Additional exclusions from examination will be considered on a case-by-case basis (Reference IWF-1230).

The staff recognized that the licensee has already addressed Item (a) but his interpretation of Items (b) and (c) is not clear. Therefore, the licensee should provide comparative information that will clearly establish the relationship between the requirements of the Code for Class 1, Class 2, and Class 3 piping supports and the initial sample size and expansion criteria proposed in his plan.

MP&L's RESPONSE

Comparison of the Code Required Inspection Plan With GGNS Sampling Plan

The GGNS sampling plan is based on a random statistical sampling over the total support population. The initial sample size and acceptance criteria is based on a performance criteria of 95/90 for the plan. At completion of the total inspection there is a 95% confidence level that no more than 10% of the supports are unacceptable in the entire population. On the other hand, the code requires an inspection of all supports in a single loop, and excludes supports in the remainder of multiple loops based on similarity. The code requirements provides a 100% confidence level that the loop examined has no unacceptable supports, but does not reflect conditions of supports in the remainder of multiple loops.

The inspection of random samples, when completed, will provide actual conditions of the total support population. Therefore, the GGNS pipe support sampling plan is superior to that required by the code. The comparisons between the code requirements and the GGNS sampling plan is presented below:

Class 1 Pipe Supports

Table 1 (attached) shows a comparison of the GGNS sampling plan with code required inspections for Class 1 pipe supports. It should be noted that the initial sample size is smaller than required by code, but if the number of unacceptable supports exceeds that required by the 95/90 performance criteria, the total population (100%) of Class 1 supports will be examined during the inspection interval.

Class 2 and Class 3 Pipe Supports

Table 2 (attached) shows a comparison of the GGNS sampling plan with the code required inspections for Class 2 and Class 3 pipe supports. The total support population for GGNS includes supports on piping 2-1/2 inch to 4-inch NPS (nominal pipe size). The code exempts supports on piping 4-inch NPS and under. It should be noted that the initial sample size used to meet the performance criteria of 95/90 is significantly less than that required by the code, but if the number of unacceptable supports exceed the acceptable criteria, an additional sample of similar size will be selected to meet the performance criteria of 95/90.

2) NRC COMMENTSection 1, Pages 4 and 7

As stated in Paragraph 2.2.3 of Section 1, 10 CFR 50.55a(b)(2)(iv) requires that the Class 2 welds on RHR and ECCS systems be selected for examination per ASME Section XI 1974 Edition with Addenda. GGNS in Paragraph 2.2.3, proposes an alternate criterion for selecting Class 2 welds on RHR and ECCS systems. A comparison of the sample size, obtained by using (1) the GGNS criteria and (2) the ASME Section XI 1974 Edition with Addenda through Summer 1975, is given in the answers to FSAR question 121.10, Reference 1. It indicates that the GGNS sample is larger by nearly a factor of two in the number of welds to be examined per interval and in the total number of welds to be examined over the life of the plant. The methodology used to select the sample should be explained in the plan to demonstrate that the minimum requirements of the Code are met or exceeded, i.e., sample size alone does not meet the requirements of the Code. Specific types of welds must be included in the sample to meet the code requirements.

Please clarify the discrepancy in the number of Category C-F welds.

MP&L's RESPONSE

As stated in the response to NRC Question 121.10 (AECM-81/334, dated September 1, 1981), the Grand Gulf Nuclear Station weld selection criteria for the RHR and ECCS systems is a plant specific, unique methodology. The weld selection criteria is a combination of the criteria contained in the 1974 Edition of ASME Section XI, 1977 Edition, Summer 1978 Addenda.

The earlier ASME Code criteria required examinations at physical configurations that could be categorized as structural discontinuities, i.e., circumferential weld joints with different base metal thickness, circumferential welds at or near anchor points, longitudinal welds in fittings, etc. The later ASME Code added stress limitations and dissimilar metal welds to the earlier Code's structural discontinuities, reduced the number of examinations for each system, and required that the initial welds selected be reexamined over the lifetime of the piping component. The 1977 Edition, Summer 1978 Addenda of the Code did not contain specific guidelines for RHR and ECCS.

The Grand Gulf Initial Ten Year Inservice Inspection (ISI) Program for the RHR and ECCS systems was based on the 1974 Edition, Summer 1975 Addenda identification of the physical piping system configurations that must be included in the overall population. From this population, a selection was made based on the selection criteria defined in Paragraph 2.2.3 of the Introduction to the ISI Program. These selection criteria are consistent with those identified in AECM-78/77. The ISI Program contains a cross-section of physical configurations as defined in Table IWC-2520 of the 1974 Edition, Summer 1975 Addenda of the Code, selected for the first ten year interval.

In addition to the requirements of the earlier Code, the GGNS program also applied the stress limitation and dissimilar metal weld criteria from the 1977 Edition, Summer 1978 Addenda of the Code to select the family of welds to be examined. Also included was the later Code's requirement for reexamination of the same weld.

By utilizing the previously stated criteria, the GGNS family of welds selected for inspection exceeds the quantity required by strict adherence to the 1974 Edition, Summer 1975 Addenda of the Code. The mix of the welds selected may differ slightly from the sampling guidelines of the 1974 Edition, Summer 1975 Addenda, but the GGNS ISI plan includes those weld configurations which have been recognized in the piping industries as producing the highest stress points and are as such, more susceptible to failure.

Concerning the discrepancy in the number of Category CF welds, the ISI plan submitted for your review reflected the latest "As-Built" information where the earlier identified quantities were based on review of design and fabrication drawings. Also, the identification of welds, CF vs CG, is more consistent with the 1977 Edition, Summer 1978 Addenda designations, which provides better distinction between piping welds vs welds in pump casings or valve bodies.

3) NRC COMMENT

General

Several categories of the ASME Code require that all dissimilar metal welds and also those experiencing specified stress levels and loads be subjected to more extensive examination. The GGNS inservice inspection plan does not identify the welds that meet these criteria. Please explain the methodology that was used to determine the extent of inspection and sample size for dissimilar metal welds and welds exceeding the stress levels specified in the Code.

MP&L's RESPONSE

To identify those welds which should be included in the inspection sample due to stress levels, a review was performed on all the applicable ASME Section III stress analyses to identify any welds with calculated stress levels exceeding those specified in ASME Section XI, Tables IWB-and IWC-2500-1.

After applying the size exemptions of Sections IWB and IWC and the pressure/temperature exemption of IWC-1220(b), the remaining population of dissimilar metal welds was established. The sample size was selected based on the requirements of Tables IWB-2500-1, Categories B-F and B-J, and IWC-2500-1, Category C-F.

For RHR and ECCS, the sample selection was based on the criteria identified in the response to Comment 2.

4) NRC COMMENT

Appendixes

Isometric Drawing RH-7-21 is apparently missing from the plan. Please supply this drawing.

MP&L's RESPONSE

Isometric Drawing RH-7-21 was inadvertently missed. The isometric is provided as an attachment to this response (see Figure 1).

5) RELIEF REQUEST

1. NRC COMMENT

Relief Requests I-0003, I-00011, pages 4-8 and 4-38
ASME Section XI, Table IWC-2500-1, Examination Category C-F, Item C5.21 (I-00003) and CF.21 (I-00011) are referenced. Please clarify these references, since Category C-F is not part of Table IWB-2500-1 and Item CF.21 is an incorrect designation.

MP&L's RESPONSE

- a) Relief Request I-00003, Section 4, page 8:
Paragraph III has been corrected to reference Table IWC-2500-1 (see Figure 2).
- b) Relief Request I-00011, Section 4, page 38:
Paragraph III has been corrected to reference Table IWC-2500-1 and Item C5.21 (see Figure 3).

2. NRC COMMENT

Relief Request I-00004, pages 4-9 through 4-11

Relief from volumetric examination of the lower one-half of the reactor pressure vessel lower head-to-shell weld (AA) is requested. The principal reason cited for requesting relief is the unavailability of automated equipment to operate on the curved surface of the lower head. Please provide a dimensioned cross-sectional drawing of the lower head-to-shell weld that clearly shows changes in vessel wall thickness and vessel head curvature in the region adjacent to the weld.

MP&L's RESPONSE

A dimensioned cross-sectional drawing of the lower head-to-shell weld including wall thickness and curvature is attached (see Figure 4).

3. NRC COMMENT

Relief Requests I-00004, I-00005, I-00006, pages 4-9 through 4-20

Relief is requested from varying percentages of volumetric examination of three circumferential shell welds (AA, AB, and AC) of the reactor pressure vessel. Please estimate the percentage of Code-required volume (CRV) that will be examined using planned volumetric methods.

Estimated personnel radiation exposures are cited in partial support of these relief requests. Have these estimated exposures been reviewed with the MP&L group responsible for establishing and implementing ALARA exposure guidelines to determine that the benefit of performing manual examination is not consistent with ALARA?

MP&L's RESPONSE

Percentages of volumetric examination of shell welds AA, AB, and AC have been estimated. The following distinguishes portions performed by remote vs manual ultrasonic techniques.

- A. Seam "AA", Relief Request I-00004
 Upper Portion - 100% UT by remote ultrasonics
 Lower Portion - 1.43% UT by manual ultrasonics due to presence of three recordable indications.
 (12"x12" area of recordable indications;
 shell cir. = 841.14", R = 133 15/16")
- B. Seam "AB", Relief Request I-00005
 Upper Portion - 100% UT by remote ultrasonics
 Lower Portion - 2.62% UT by manual ultrasonics due to presence of four recordable indications.
 (13"x22" area of 4 recordable indications;
 shell circ. = 841.14", R = 133 15/16")
- C. Seam "AC"
 83% of total seam performed by remote ultrasonics, as stated in relief request.

The Grand Gulf ALARA Committee has assessed the exposure levels discussed by the subject relief request and found them to be reasonable.

4. NRC COMMENT

Relief Request I-00010, pages 4-34 to 4-37

Relief is requested from volumetric examination of inaccessible Class 1 and Class 2 welds as detailed in Table 1 of the request. The table includes three welds (Items 6, 7, and 8) designated on Isometrics FW-8-2, FW-8-4, and FW-11-7. Please confirm that relief is requested for these welds in the feedwater system and that the system should be included in Paragraph I, component description.

MP&L's RESPONSE

Relief Request I-00010, Section 4, page 34:
 Paragraph I has been corrected to include the feedwater system as referenced in Table 1 of Section 4, page 36 (see Figure 5).

5. NRC COMMENT

Relief Request I-00012

Relief is requested for volumetric examination of 25% of the Class 1 weld, Weld 502, located on the reactor core isolation cooling system (RCIC, E51). Table 1 in the relief request references Isometric Drawing R1-11-7, which is included in Volume III of the proposed ISI program as Revision 0, dated 5/1/84. Since this drawing does not indicate Weld 502, please provide a reference to the appropriate drawing which would illustrate the location and inaccessibility of the weld portion.

MP&L RESPONSE

Relief Request I-00012

A partial revision of Isometric R1-11-7 is attached showing weld 502. This drawing is for reference only and has not been issued as part of Revision 1 to the 10-year plan (see Figure 6).

TABLE - 1

PIPE SUPPORT SAMPLING PLAN FOR ASME CLASS 1 PIPING

SUPPORT CATEGORY	GGNS ISI TOTAL POPULATION	CODE REQUIRED SIZE UTILIZATING MULTIPLE LOOP EXEMPTION ^[1]	GGNS ISI PLAN		
			INITIAL SAMPLE SIZE	RESAMPLE SIZE [2]	TOTAL [3]
SPRING	69	45	40	29	69
RIGID (Std.Comp.)	40	35	21	19	40
RIGID (Frame)	85	74	40	45	85
TOTAL	194	154	101	93	194

1. Code requires inspection of all supports (100%) in a single loop and excludes supports on the remainder of the multiple loops.
2. Additional inspection, if number of unacceptable supports in the initial sample exceed the acceptance criteria.
3. All supports (100%) will be examined within the inspection interval if the result of inspection of the initial sample is unacceptable.

TABLE - 2

PIPE SUPPORT SAMPLING PLAN FOR ASME CLASS 2 and CLASS 3 PIPING

SUPPORT CATEGORY	[1] CODE POPULATION	CODE REQUIRED [2] SIZE UTILIZATING MULTIPLE LOOP EXEMPTION	GGNS ISI PLAN			
			TOTAL [3] POPULATION	INITIAL SAMPLE SIZE	RESAMPLE SIZE [4]	TOTAL
SPRING	67	42	79	40	39	79
ANCHOR	42	30	66	40	26	66
RIGID (Std.Comp.)	489	350	712	100	100	200
RIGID (Frame)	322	238	638	100	100	200
TOTAL	920	660	1495	280	265	545

1. Pipe supports on 4" NPS or under excluded.
2. Code requires inspection of all supports (100%) in a single loop and excludes supports on the remainder of the multiple loops.
3. GGNS ISI population includes supports on 2-1/2" to 4" NPS and does not exclude supports on similar loops.
4. Additional inspection, if number of unacceptable supports in the initial sample exceed the acceptance criteria. GGNS may elect to use the equation shown in Table 3 to determine the size of additional samples.

TABLE - 3

FORMULA TO DETERMINE ADDITIONAL SAMPLE SIZE

The following equation may be used to determine the size of the additional samples.

$$N = S \left(\frac{2}{c + 1} \right)^2 (a - c) \quad \text{where:}$$

S = Initial Sample Size
 c = Allowable number of defective supports
 a = Total number of defective supports in the total sample

For $c = 5$ and $S = 100$, the first re-sample size will be

$$N_1 = 11.11 (a - 5).$$

Further sampling will continue according to the expression

$$N_2 = (b)(S) \left(\frac{2}{c + 1} \right)^2 \quad \text{where:} \quad b = \text{No. of defective supports in the previous re-sample.}$$
$$= (11.11) (b)$$

This process will continue until no additional defective supports are found.

FIGURE 1

RH-O-2A

④ INSP. AT LEAST EVERY 18 MTHS.

GENERAL ELECTRIC

21	SH NO	REV	DATE
			5-1-84

GRAND GULF NUCLEAR STATION
UNIT 1

PAGE 1 of 1

REQUEST FOR RELIEF NO. I-00003

INSERVICE INSPECTION
OF CIRCUMFERENTIAL DISSIMILAR METAL WELD

- I. Component: Circumferential dissimilar metal weld (FW-13) between reactor core isolation cooling (RCIC) line 20"-HBB-53 and 20"-HCB-29. Line 20"-HCB-29 is the RCIC turbine exhaust sparger.
- II. Code: The subject pressure retaining, circumferential, dissimilar metal weld is fabricated in accordance with ASME Section III, Class 2 requirements. Inservice inspection is to be performed in accordance with ASME Section XI, 1977 Edition through and including Summer 1979 Addenda.
- III. Code requirements: The pressure retaining, circumferential, dissimilar metal, Class 2 weld is required to be surface (PT or MT) and volumetrically (ultrasonically) inspected once every ten-year interval in accordance with ASME Section XI, Table IWC-2500-1, Examination Category C-F, Item #C5.21, Note (1)(c).
- IV. Information to support the determination that the code requirement is impractical: The implementation of the code requirement is impractical as the subject weld is in constant contact with the water in the suppression pool. When the suppression pool is at its lowest level (Post-LOCA 111'-4 3/4"), the subject weld is submerged under 6'-4 3/4" of water.
- V. Specific relief requested: Permission is requested to exempt RCIC turbine exhaust sparger weld (FW-13) from inservice inspection, except as noted in alternative testing.
- VI. Reasons why relief should be granted: Request for exemption should be granted for the following reasons:
1. The subject weld has been volumetrically examined by radiography and found acceptable in accordance with ASME Section III, Class 2 requirements.
 2. The subject weld will only be exposed to design pressure and temperature a small percentage of the time the plant operates. The balance of that time, it will see static conditions at near atmospheric pressure, along with relatively low temperatures.
 3. The open area of the sparger hole is over 300% of the cross sectional area of the pipe itself. The steam will flow through the sparger relatively unimpeded, permitting only low pressure buildup in the pipe.
- VII. Alternative testing: No alternative testing is proposed at this time. However, if the suppression pool is drained for other reasons, inspection of the weld will be performed.

GRAND GULF NUCLEAR STATION
 UNIT 1

REQUEST FOR RELIEF NO. I-00011

INSERVICE INSPECTION
OF THERMAL TEE SLEEVE WELDS

- I. Component: Thermal tee sleeve welds D011-A-1 and D011-B-1 located on the residual heat removal (RHR) return from reactor water cleanup (RWCU) line (See attached sketch for location of the welds).
- II. Code: Pressure retaining thermal tee sleeve welds D011-A-1 & D011-B-1 were fabricated in accordance with ASME Section III, Class 2 requirements. Inservice inspections are to be performed in accordance with ASME Section XI, 1977 Edition through and including Summer 1979 Addenda.
- III. Code requirements: Thermal tee sleeve welds are required to be surface (magnetic particle) and volumetrically (ultrasonic) inspected once every ten-year inservice inspection interval in accordance with ASME Section XI, Table IWC-2500-1, Examination Category C-F, Item #C5.21.
- IV. Information to support the determination that the code requirement is impractical: Due to the design of the thermal tee sleeve, there is not sufficient area to perform a meaningful ultrasonic examination. Also, the position of the thermal sleeve, as well as lack of internal access, precludes the use of radiography.
- V. Reasons why relief should be granted: Request for exemption from inservice volumetric (ultrasonics and radiography) inspections of thermal tee welds D011-A-1 and D011-B-1 on the RHR return to RWCU line, should be granted for the following reasons:
1. The thermal tee welds have been volumetrically examined by radiography and found acceptable in accordance with ASME Section III, Class 2 requirements.
 2. The thermal tee welds have been surface examined by magnetic particle and found acceptable in accordance with ASME Section XI, Class 2 requirements.
 3. The thermal tee welds will be subject to magnetic particle inspection every ten-year interval in accordance with ASME Section XI, Class 2 requirements.
 4. Thermal tee welds will be subject to a system pressure test in accordance with ASME Section XI, Class 2 requirements.

GRAND GULF UNIT ONE
BOTTOM HEAD TO RING #1

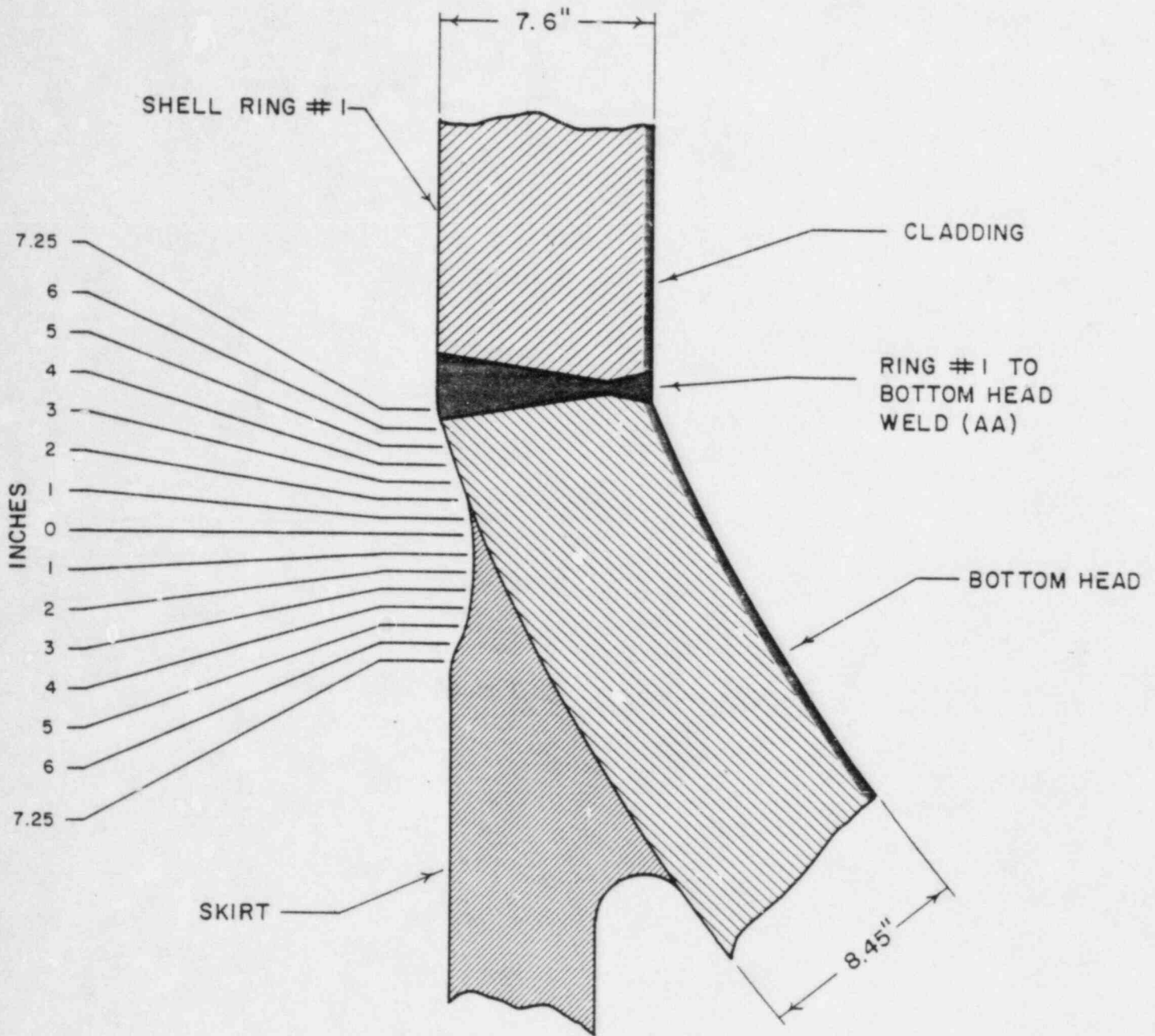


FIGURE 4

PAGE 1 of 4

GRAND GULF NUCLEAR STATION
UNIT 1

REQUEST FOR RELIEF NO. I-00010

INSERVICE INSPECTION
OF PRESSURE RETAINING WELDS

- I. Component: Inaccessible portions of Class I and Class II pressure retaining piping welds located on residual heat removal (RHR, E12), reactor core isolation cooling (RCIC, E51), main steam (MS, B21) recirculation (Recirc., B33), reactor water cleanup (RWCU, G33), and feedwater (FW, B21) systems. (See Table 1 for details)
- II. Code: These portions of the pressure retaining piping welds were designed and fabricated to the ASME Section III, Class 1 and Class 2 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition through and including Summer 1979 Addenda.
- III. Code requirements: Class 1 and Class 2 pressure retaining piping welds are required to be volumetrically and surface examined, essentially 100% of the weld, once every ten-year interval in accordance with ASME Section XI, Table IWB-2500-1, Category B-J, Table IWC-2500-1, Category C-F.
- IV. Information to support the determination that the code requirements are impractical: Portions of welds that were preservice examined have physical obstructions due to design. due to this limited accessibility, it is impractical to volumetrically examine 100% of the welds listed on Table 1.
- V. Specific relief requested: Permission is requested to exempt from volumetric examination the inaccessible portions of the Class 1 and Class 2 welds listed on Table 1.
- VI. Reasons why relief should be granted: Request for an exemption should be granted for the following reasons:
1. The inaccessible portions of listed welds were examined by radiography, passed in accordance with ASME Section III, Class 1 and Class 2 requirements.
 2. The inaccessible portions of listed welds were surface examined (magnetic particle or liquid penetrant), passed in accordance with ASME III and/or XI, Class 1 and Class 2 requirements.
 3. The inaccessible portions of listed piping welds will be subject to a system leakage test after each refueling outage for Class 1, and each inspection period for Class 2 in accordance with ASME Section XI requirements.

FIGURE 6

