



OLIVER D. WISLEY, JR.
Vice President
Nuclear Operations

May 24, 1988

U. S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D. C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Inservice Inspection Plan Relief
Request
AECM-88/0104

This submission provides requests for relief from the requirements of ASME Section XI. This relief is requested in accordance with 10CFR 50.55a(g)5(iii).

While performing inservice examinations during Refueling Outage 2 several conditions were identified where ASME Section XI required volumes were inaccessible. ASME Section XI, 1977 Edition, Summer 1979 Addenda, specifies specific volumes of weld and base materials that require examination. ASME Section XI does not provide any allowances for material volumes that may be inaccessible due to geometric or access restrictions.

Attached are two revised Relief Requests (I-00007, Revision 1 and I-00010, Revision 2) and one new Relief Request (I-00019, Revision 0).

The purpose of Relief Request I-00007 Revision 1 is to provide clarification to the contents of Table 1 by changing the title of the column originally identified as "limited area" to "EXAMINABLE VOLUMETRIC AREA" and adding another column "EXAMINABLE SURFACE AREA". This revision clarifies and corrects the information pertaining to the amount of examination coverage that is obtainable.

Relief Request I-00010, Revision 2 provides the same changes as discussed for Relief Request I-00007, Revision 1. In addition, welds have been added that require relief from the full volumetric examination and also limitations in the required surface examinations are identified.

Relief Request I-00019, Revision 0 identifies specific areas of the Reactor Pressure Vessel that require relief from ASME Section XI required examinations.

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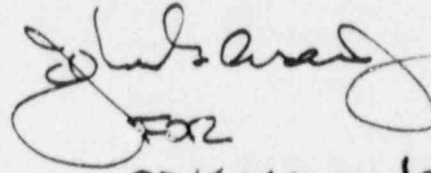
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Your expeditious review and approval is requested prior to October 31 1988, since this is the completion of Grand Gulf Nuclear Station's first forty month period. If additional information is required to support your review, please contact this office.

Yours truly,


ODKINSLEY JR.

ODK:bms
Attachment

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GRAND GULF NUCLEAR STATION
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RELIEF REQUEST NO. I-00007 REVISION 1

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INSERVICE INSPECTION
OF
PIPING WELDS WITHIN GUARD PIPES

- I. Component: ASME Section III, Class 1 pressure retaining circumferential welds located in Feedwater Loops A and B (B21), Main Steam (B21), Reactor Core Isolation Cooling (E51), Residual Heat Removal (E12), and Reactor Water Clean-up (G33) piping. These welds are located on system piping inside guard pipes, which extend beyond the containment. The applicable welds are listed in Table 1.
- II. Code: These welds were designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspection is to be performed in accordance with ASME Section XI, 1977 Edition through and including Summer of 1979 Addenda.
- III. Code Requirements: Class 1 pressure retaining piping welds are required to be volumetrically and surface examined once each ten year inspection interval in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-J.
- IV. Information to support the determination that the code requirements are impractical: The circumferential welds joining the flued head and the process pipe are encapsulated by the portion of the guard pipe which protrudes beyond the containment. To comply with the inservice inspection requirements of ASME Section XI, two 4" x 6" elliptical access ports spaced 180° apart are provided for access to the welds. During the development of the access port design, the inservice contractor had indicated that the ports were adequate to permit performance of surface and ultrasonic examination of the entire weld. After fabrication and installation of the process pipe, guard pipe and the flued head, it was determined that the entire length of the weld is not accessible through the two access ports.

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V. Specific relief requested:

Permission is requested to perform ultrasonic examination of the welds listed in Table 1 to the extent possible through the 4" x 6" access ports. Also, permission is requested to perform the code required surface examinations on the same welds to the extent possible through the access ports. The percentage of each weld examined will be recorded during the inservice examination.

VI. Reasons why relief should be granted:

Exemption is requested for the inservice inspection of inaccessible portions of welds located inside guard pipes for the following reasons:

1. All but two of these lines were designed to high energy pipe break criteria. The exceptions are Q1E12G012W47 and Q1E51G001W12 which are classified as moderate energy pipes.
2. These welds were designed and fabricated in accordance with ASME Section III, Class 1 requirements and were examined by radiographic and liquid penetrant techniques.
3. These welds have satisfactorily passed both liquid penetrant and ultrasonic examinations in accordance with ASME Section XI, Class 1 requirements (preservice relief request No. 00001).
4. Class 1 isolation valves in the process pipe on both sides of the guard pipes are capable of completely isolating each pipe in the event of a pipe failure.
5. The guard pipes have been designed and constructed in accordance with ASME Section III, Class 2 requirements and were hydrostatically tested in accordance with ASME Section III, Class 2 requirements.

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VI. Reasons why relief should be granted:
(continued)

6. The guard pipes are open to the drywell environment; thus, any leakage due to weld failure will be contained within the drywell. The guard pipes will prevent any leakage from escaping to the Containment Building.
7. The process pipes inside the guard pipes were hydrostatically tested in accordance with ASME Section III, Class 1 requirements.
8. The process piping inside each guard pipe assembly will be subject to periodic pressure tests in accordance with ASME Section XI, Table IWB-2500-1, Category B-P, requirements.

VII. Alternative testing:

The accessible length of each weld will be ultrasonically and surface examined in accordance with ASME Section XI, Table IWB-2500-1, Examination Category B-J. Should signs of weld deterioration or discrepancies be noted during regular inspections, evaluation of the conditions will be made.

NOTE: In addition, a relief request (No. 00001) based on the above logic for four (4) welds on main steam pipes was submitted earlier with the Unit 1 preservice inspection. The Nuclear Regulatory Commission accepted this request for relief in GGNS Safety Evaluation Report, Supplement #2.

VIII. NRC Discussion Statements (Revision 0)

The following statements, conclusions, recommendations, etc. have been adopted by the NRC and are to be considered part of this request for relief approval.

Therefore, relief is recommended as requested provided:

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- VIII. NRC Discussion Statements (Revision 0) continued
- (a) the volumetric and surface examinations are performed to the maximum extent practical and
 - (b) the Code-required surface examinations and system pressure tests are performed, and visually inspected.

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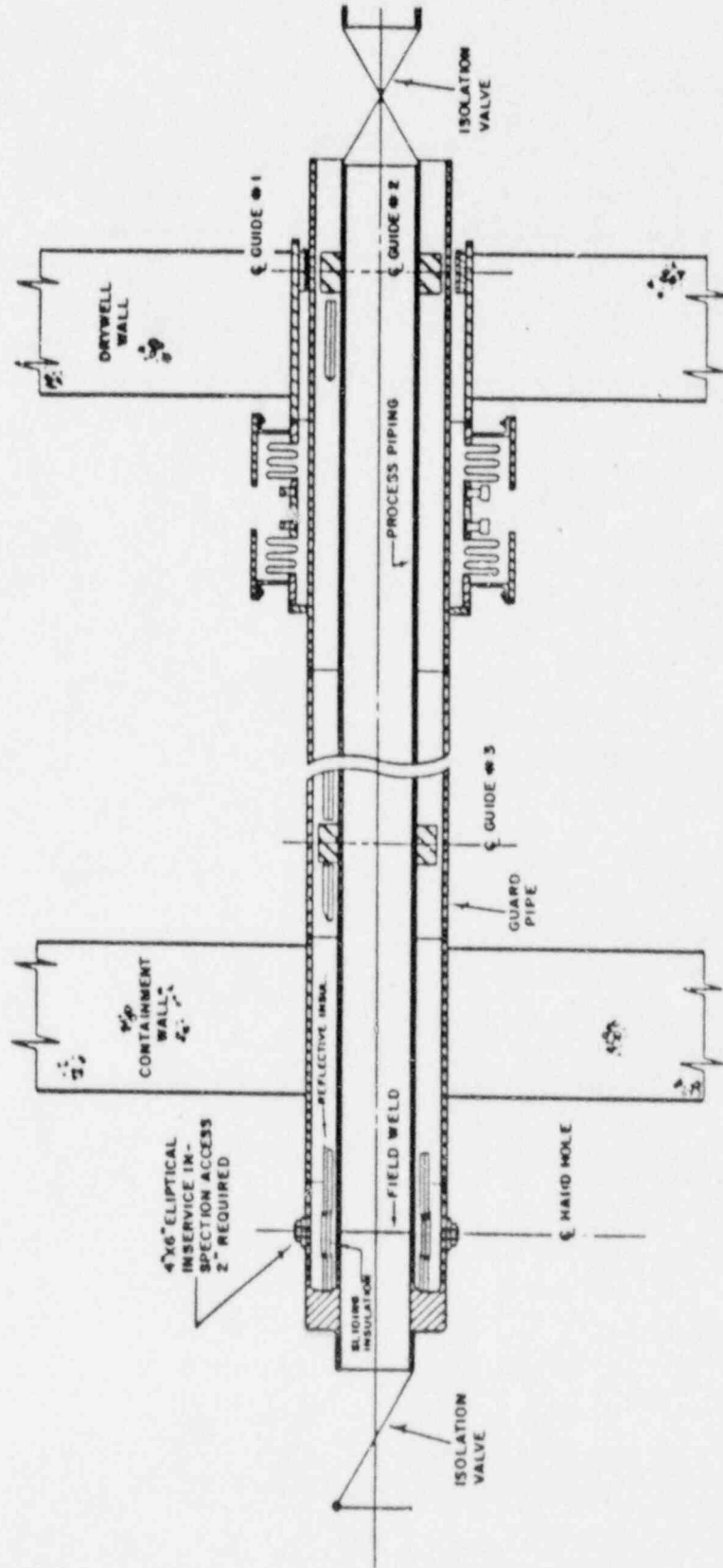
TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
1	B21	G12-C1-A	MS-11-9	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
2	B21	G12-A1-A	MS-11-3	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
3	E51	G12-D1-A	MS-11-12	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
4	B21	G12-B1-A	MS-11-6	28"	PIPE TO PIPE	27%	T	NOTE 1	1	CIRC	GUARD PIPE
5	B21	W2	FW-11-1	24"	PIPE TO PIPE	24%	T	NOTE 1	1	CIRC	GUARD PIPE
6	B21	W18	FW-11-7	24"	PIPE TO PIPE	24%	T	NOTE 1	1	CIRC	GUARD PIPE
7	DELETED										
8	E12	W47	RH-11-1	20"	PIPE TO PIPE	19%	T	NOTE 1	1	CIRC	GUARD PIPE
9	E51	W12	RI-8-9	6"	PIPE TO PIPE	50%	T	NOTE 1	1	CIRC	GUARD PIPE
10	E51	W7	RI-11-3	10"	PIPE TO PIPE	100%	T	NOTE 1	1	CIRC	GUARD PIPE
11	G33	W18	CU-11-3	6"	PIPE TO PIPE	50%	T	NOTE 1	1	CIRC	GUARD PIPE

NOTE 1: The percentage of each weld that is accessible for surface examination will be recorded during the inservice examination.

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FIGURE 1



VERTICAL SECTION THRU GUARD PIPE ASSEMBLY

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INSERVICE EXAMINATION
OF
PRESSURE RETAINING WELDS

- I. Component: Inaccessible portions of ASME Section III, Class 1 and 2 pressure retaining and integral attachment piping welds listed in table 1 (see attached).
- II. Code: These portions of the pressure retaining and integral attachment piping welds were designed and fabricated to 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 the 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. The Class 1 integral attachment welds depicted in table 1 are required to be surface examined once each ten year interval in accordance with ASME Section XI, Table IWB-2500-1, Category B-K-1.
- 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 perform the surface and volumetric examination for 100% of the required examination volume as indicated for the welds listed in Table 1.
- V. Specific relief requested: Permission is requested to perform the Code required examinations to the extent described in Table 1.

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VI. Reasons why relief
should be granted:

Request for permission to limit the code required examination to the accessible areas should be granted for the following reasons:

1. The inaccessible portions of listed pressure retaining welds were examined by radiography, passed in accordance with ASME Section III, Class 1 and 2 requirements.
2. The inaccessible portions of the pressure retaining and integral attachment 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.
4. The inaccessible portions of listed piping welds will be subject to a system hydrostatic test each inspection interval in accordance with ASME Section XI, Class 1 and 2 requirements.
5. Accessible portions of listed welds will be volumetrically and surface examined each inspection interval in accordance with ASME Section XI. Should indications be found, an engineering evaluation will be made to determine if the inaccessible portions of the listed welds have been affected.
6. Leak detection is provided, by way of the leakage detection system with continuous monitoring, for the RHR, RCIC, MS, RWC, RECIRC and FW systems.

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VI. Reasons why relief should be granted:
(continued)

7. The failure of any one of these pressure retaining piping welds would have no adverse effect on plant safety as there is isolation capability and/or shut down capability as part of the plant design.

8. The calculated maximum piping stresses and usage factor at the integral attachments on the piping, including consideration of the local pipe wall stresses, have been determined in the class 1 stress report and are equal to the following:

a) Primary plus secondary (equation 10);
32,775 psi (1.72 S_m),

b) usage factor is 0.0442.

Circumferential and longitudinal welds in piping with stress levels below $2.4 S_m$ and usage factors below 0.4 are excluded from ISI examinations, in accordance with Table IWB-2500-1, Category B-J

9. Examinations at GGNS of category B-J, B-K-1 and C-F welds have not identified any flaws or evidence of service induced degradation.

VII. Alternative testing:

All the welds identified in Table 1 will be inspected twice by volumetric or surface examination, as applicable, during the 10 year interval as discussed in GGNS Safety Evaluation Report, Supplement #2.

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VIII. NRC Discussion
statement (for
revision 1):

As reported in the Safety Evaluation Report dated July 22, 1985, all of the subject welds will receive volumetric examination of the accessible portions during the inspection interval. The licensee has also committed to conduct an engineering evaluation of the entire weld condition if indications are found during the volumetric examinations. The Code-required surface examination and pressure tests will be conducted on all the welds.

The licensee has also stated failure of any of the subject welds would not have an adverse affect on plant safety since all of the areas can be isolated or the system can be shutdown in a manner consistent with plant design. In addition, continuous leak detection monitoring is provided on all of the systems containing inaccessible welds.

Based on the review of Revision 1 of Relief Request I-00010 (Rev. 1) and the SER dated July 22, 1986, it is concluded that the limited Section XI volumetric examination, along with the Code-required Section XI surface examination and the hydrostatic test, ensure an acceptable level of inservice structural integrity and that compliance with the specific requirements of section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, relief is granted as requested.

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TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
1	E12	G014-FW-44	RH-8-8	6"	VALVE TO ELBOW	55%	T	100%	1	CIRC	ELBOW RADIUS
2	B21	G9-C1-B-L/B	MS-11-8	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
3	E51	G004-8-8-1	RI-8-2	6"	ELBOW TO ELBOW	70%	T	100%	2	CIRC	ELBOW RADIUS
4	B21	G11-D1-B-L/B	MS-11-11	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
5	B21	G8-A1-B-L/A	MS-11-2	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
6	B21	G030-FW-23	FW-8-2	24"	VALVE TO PIPE	93%	T	100%	1	CIRC	SOCK-O-LET
7	B21	G030-FW-36	FW-8-4	24"	VALVE TO PIPE	93%	T	100%	1	CIRC	SOCK-O-LET
8	B21	G026-FW-17	FW-11-7	6"	PIPE TO TEE	93%	T	100%	1	CIRC	SOCK-O-LET
9	B21	G001-W4	MS-11-3	28"	VALVE TO PIPE	82%	T	100%	1	CIRC	PIPE RESTRAINT
10	B21	G001-W4	MS-11-9	28"	VALVE TO ELBOW	82%	T	100%	1	CIRC	PIPE RESTRAINT
11	B21	G9-C1-B-L/A	MS-11-8	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
12	B33	G5-B1-E	RR-11-9	4"/24"	SWEEP TO PIPE	69%	T	100%	1	BRANCH	SWEEP-O-LET

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TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
13	E51	G004-7-8-4	RI-8-1	10"	REDUCER TO TEE	71%	T	100%	2	CIRC	TEE
14	E51	G004-7-8-9	RI-8-1	10"	REDUCER TO TEE	71%	T	100%	2	CIRC	TEE
15	E51	G004-7-8-8	RI-8-1	10"	REDUCER TO TEE	71%	T	100%	2	CIRC	TEE
16	B33	G024-W2	RR-11-19	4"	ELBOW TO TEE	62%	T	100%	1	CIRC	TEE
17	G33	G002-W179	CU-8-7	4"	ELBOW TO FITT.	63%	T	NA	1	CIRC	ELBOW RADIUS
18	B21	G11-D1-B-L/A	MS-11-11	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
19	B21	G001-W9	MS-11-12	28"	VALVE TO PIPE	82%	T	100%	1	CIRC	PIPE RESTRAINT
20	B21	G8-A1-B-L/A	MS-11-2	28"	ELBOW SEAM	38%	T	38%	1	LONG	PIPE RESTRAINT
21	E51	G001-W1	RI-8-12	6"	VALVE TO ELBOW	73%	T	100%	2	CIRC	ELBOW RADIUS
22	E51	G001-W40	RI-11-4	6"	VALVE TO ELBOW	73%	T	100%	1	CIRC	ELBOW RADIUS
23	B33	G001-W5	RR-11-2	24"	ELBOW TO PUMP	73% see note 1	T	100%	1	CIRC	PUMP
24	B33	G001-W6	RR-11-2	24"	PIPE TO PUMP	58% see note 1	T	100%	1	CIRC	PUMP

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TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
25	B33	G001-W8	RR-11-3	24"	VALVE TO PIPE	50% see note 2	T	100%	1	CIRC	VALVE
26	B33	G001-W28	RR-11-9	24"	ELBOW TO PUMP	62% see note 1	T	100%	1	CIRC	PUMP
27	B33	G001-W29	RR-11-9	24"	PUMP TO PIPE	61% see note 1	T	100%	1	CIRC	PUMP
28	B33	G001-W31	RR-11-10	24"	VALVE TO PIPE	50% see note 1 & 2	T	100%	1	CIRC	VALVE
29	B33	G5-B1-B	RR-11-9	4"/24"	SWEEP TO PIPE	59% see note 1	T	100%	1	BRANCH	SWEEP-O-LET
30	B33	G5-B1-E	RR-11-9	4"/24"	SWEEP TO PIPE	63% see note 1	T	100%	1	BRANCH	SWEEP-O-LET
31	B33	G023-W37	RR-11-15	20"	TEE TO PIPE	65% see note 1	T	100%	1	CIRC	TEE
32	B33	G024-W8	RR-11-16	4"	PIPE TO SWEEP	50% see note 2	T	100%	1	CIRC	SWEEP-O-LET
33	B33	G024-W27	RR-11-17	4"	PIPE TO SWEEP	50% see note 2	T	100%	1	CIRC	SWEEP-O-LET
34	B33	G10-B1-L	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
35	B33	G10-B1-K	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
36	B33	G10-B1-J	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET

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TABLE 1

ITEM NO	SYSTEM NO	WELD NO	ISO NO	PIPE SIZE	COMPONENT	EXAMINABLE VOLUMETRIC AREA	TYPE SCAN	EXAMINABLE SURFACE AREA	CLASS	WELD TYPE	REASON FOR LIMITATIONS
37	B33	G10-B1-H	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
38	B33	G10-B1-G	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
39	B33	G10-B1-F	RR-11-11	12"/16"	SWEEP TO PIPE	50% see note 3	P	100%	1	BRANCH	SWEEP-O-LET
40	B33	G001-W34	RR-11-11	24"	PIPE TO CROSS	50% see note 3	P	100%	1	CIRC	CROSS
41	B33	G10-B1-A	RR-11-11	16"	PIPE TO CROSS	50% see note 3	P	100%	1	CIRC	CROSS
42	B33	G10-B1-B	RR-11-11	16"	PIPE TO CROSS	50% see note 3	P	100%	1	CIRC	CROSS
43	B21	G8-A1-C	MS-11-2	8"/28"	SWEEP TO PIPE	100%	T	98%	1	BRANCH	PIPE SUPPORT
44	B21	G026-W36	FW-11-1	24"	PIPE TO VALVE	95%	T	100%	1	CIRC	PIPE SUPPORT
45	B21	G8-A1-L,M,N,P	MS-11-2	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
46	B21	G10-B1-L,M,N,P	MS-11-5	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
47	B21	G9-C1-L,M,N,P	MS-11-8	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT
48	B21	G11-D1-L,M,N,P	MS-11-11	28"	LUGS TO PIPE	N/A	N/A	49%	1	INT ATT	PIPE RESTRAINT

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TABLE 1

LEGEND:

P = SCAN PARALLEL TO THE WELD
T = SCAN TANGENT (PERPENDICULAR) TO THE WELD

NOTES:

1. In addition to the "T" scan limitation, these welds are augmented by the requirements of NUREG 0313 and therefore are examined with a parallel scan that is not required by ASME Section XI. The parallel scan is limited to one side of the weld (50%) due to the fittings being joined by the weld.
2. 100% coverage was obtained in one direction only, using refracted longitudinal wave.
3. The "P" scan is performed for compliance with NUREG 0313, 100% of ASME Section XI coverage is obtained without limitation.

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INSERVICE EXAMINATION
OF
REACTOR PRESSURE VESSEL ITEMS

- I. Component: Inaccessible portions of the Reactor Pressure Vessel (RPV) as listed below.
1. Jet Pump Instrument Nozzles (N-9 A&B), safe end to penetration seal welds (see figure 1).
 2. RPV flange stud hole ligament areas (see figure 2).
- II. Code:
1. The Jet Pump Instrument Nozzle assemblies were designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition, through and including the Summer 1979 Addenda, Table IWB-2500, Category B-J.
 2. The RPV flange assembly is designed and fabricated to ASME Section III, Class 1 requirements. Applicable inservice inspections are to be performed in accordance with the ASME Section XI, 1977 Edition, through and including the Summer 1979 Addenda, Table IWB-2500, Category B-G-1.
- III. Code Requirements:
1. ASME Section XI, Table IWB-2500, Category B-J, requires the safe end to penetration seal weld to be volumetrically and surface examined. The examinations are to be performed once each inspection interval.
 2. ASME Section XI, Table IWB-2500, Category B-G-1, requires the threads in the RPV flange stud hole, and one inch of base material around the stud hole, to be volumetrically examined for a depth equal to the diameter of the stud. The examinations are to be performed once each inspection interval.

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IV. Information to support the determination that the code requirements are impractical:

1. The welds requiring relief attach the penetration seal to the safe end. The penetration seal is a forged item allowing 14 socket welded connections for each of the two N9 nozzles. The configuration of the penetration seal and the installing weld limits the access required for obtaining full code coverage of the weld and associated base material.

The weld is volumetrically examined from the safe end obtaining 44.7% coverage of the code volume. Examination from the weld and from the penetration seal side of the weld is prohibited due to component configuration and weld geometry (see figure 1).

2. The area of the RPV flange requiring relief is located between the stud hole and the RPV inside diameter (ligament area). The ligament area also contains the sealing surface that makes contact with the RPV head flange. The seal surface is comprised of deposited weld material, and raised approximately 1/2 inch above the flange face creating a geometrical obstruction.

A code volume of 96% is volumetrically examined without interference with the seal surface. The remaining 4% is contained within the restricted area associated with the seal surface (see figure 2).

V. Specific relief requested:

Permission is requested to perform the Code required volumetric examinations to the extent described above and shown in figures 1 and 2.

VI. Reasons why relief should be granted:

Request for permission to limit the code required examination to the accessible areas should be granted for the following reasons:

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VI. Reasons why relief
should be granted:
(continued)

1. N9 NOZZLE TO PENETRATION SEAL

- a. The subject welds were installed, radiographed, surface examined and hydrostatically tested to the requirements of ASME Section III, Class 1.
- b. The subject welds are completely surface examined during inservice activities once each inspection interval.
- c. The welds are subject to a system leakage test at completion of each refueling outage and a system hydrostatic test once each inspection interval.
- d. The safe end material is SA 336-F8 (304) stainless steel, and the penetration seal is 304L stainless steel. Due to the geometric configuration of the weld joint, the examination can only be conducted from the safe end side of the joint, and therefore, not obtaining full coverage. The examination is able to obtain 44.7% of the code required volume. The examineable area includes the inside surface of the safe end (304 stainless steel material) including the heat affected zone.

The primary degradation mechanism at this location is intergranular stress corrosion cracking (IGSCC). Fatigue is not a significant factor due to the limited fatigue loading at this location. Therefore, the potential for cracking at this location should

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VI. Reasons why relief
should be granted:
(continued)

consider IGSCC only. The occurrence of IGSCC is caused by the simultaneous presence of three factors; 1) high stress, 2) aggressive environment, and 3) susceptible material. The safe end and penetration seal side of the weld both see essentially the same stress and environmental conditions. However, there is a significant difference in material susceptibility between the 304 SS safe end and the 304L penetration seal. Generic Letter 88-01, NUREG 0313 Revision 2, recognizes 304L type materials as being IGSCC resistant. The 304 portion of the assembly including that side of the weld root is examined from one direction utilizing IGSCC techniques and qualified personnel. In addition, Generic letter 88-01 excludes all piping smaller than 4 inches in nominal diameter. The N9 A&B safe ends are less than four inches in nominal diameter, and therefore, under the rules of the generic letter, the safe ends are not susceptible to IGSCC.

- e. The accessible portions of the subject welds will be volumetrically examined and the complete weld and adjacent base material will be surface examined in accordance with ASME Section XI. Should indications be found, an engineering evaluation will be made to determine if the inaccessible portions of the subject welds have been affected.
- f. Any leakage occurring from the N9 nozzles would be detected by the existing leakage detection system.

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VI. Reasons why relief
should be granted:
(continued)

- g. Mechanical preparation of the weld would allow additional coverage to be obtained by facilitating transducer placement on top of the weld. The efforts necessary for obtaining the improved coverage would require a man rem expenditure of approximately 21.2 whole body and 37.2 for the extremities. The total man rem exposure required to obtain the additional examination coverage is not justified based on the low probability of IGSCC occurrence and the limited fatigue loading at the subject welds.
- h. Examination history at GGNS has not recorded any flaws or evidence of service induced degradation in category B-J welds.
- i. The limited examination of the two N-9 nozzles (A&B) is considered to be sufficient to determine the structural integrity of welded assemblies.

2. RPV FLANGE STUD HOLE

- a. The RPV flange was fabricated as part of the RPV assembly and tested to the requirements of ASME Section III, Class 1.
- b. The RPV, including the flange assembly, is subject to a system leakage test at completion of each refueling outage and a system hydrostatic test once each inspection interval.

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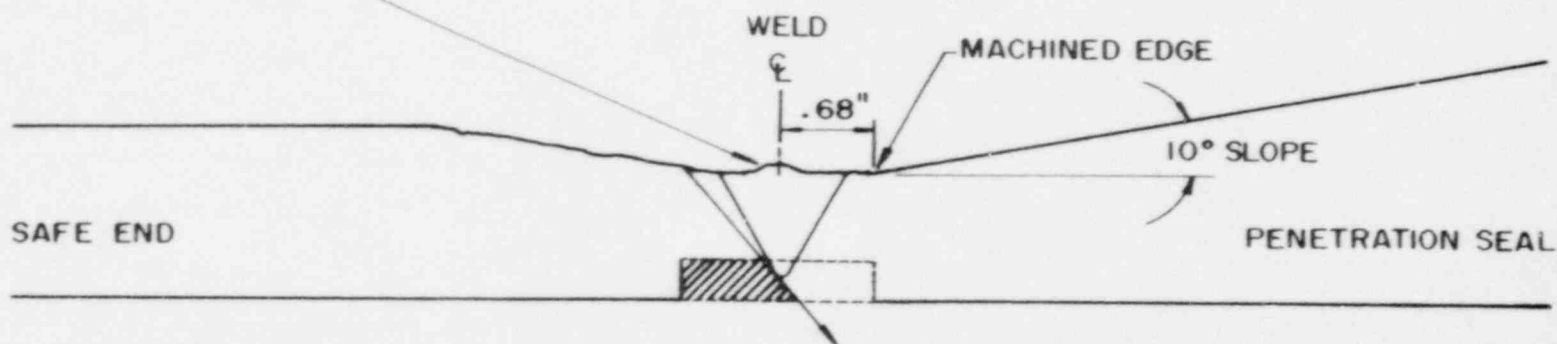
VI. Reasons why relief
should be granted:
(continued)

- c. The entire code volume around the stud hole is examined except for the area associated with the sealing surface. This area is examined for a distance of 1/2 inch from the stud hole before interference from the seal surface is encountered. With the RPV head in place, and fastened with the studs to the RPV shell flange, the seal surface and underlying material is subjected to compressional loads. The material in the vicinity of the threads or adjacent to the stud hole is subjected to shear loading with the head in place. Therefore, the limiting location with respect to applied stress is the material nearest the stud hole threads. Since this limited area is examined, any anticipated flaw initiation will be detected.
- d. The amount of obtained volumetric coverage that includes the bounded area is adequate to ensure structural integrity of the stud hole regions of the RPV flange.

VII. Alternate testing None

N9 A & B
SAFE END TO PENETRATION SEAL
44.7% EXAMINED IN ONE DIRECTION

HUMP AT ϕ OF WELD PREVENTS SCANNING
COMPLETELY ACROSS WELD



 CODE VOLUME FOR VOLUMETRIC EXAMINATION = .228 IN²


 EXAMINABLE VOLUME FOR VOLUMETRIC EXAMINATION = .102 IN² or 44.7%

FIGURE 1

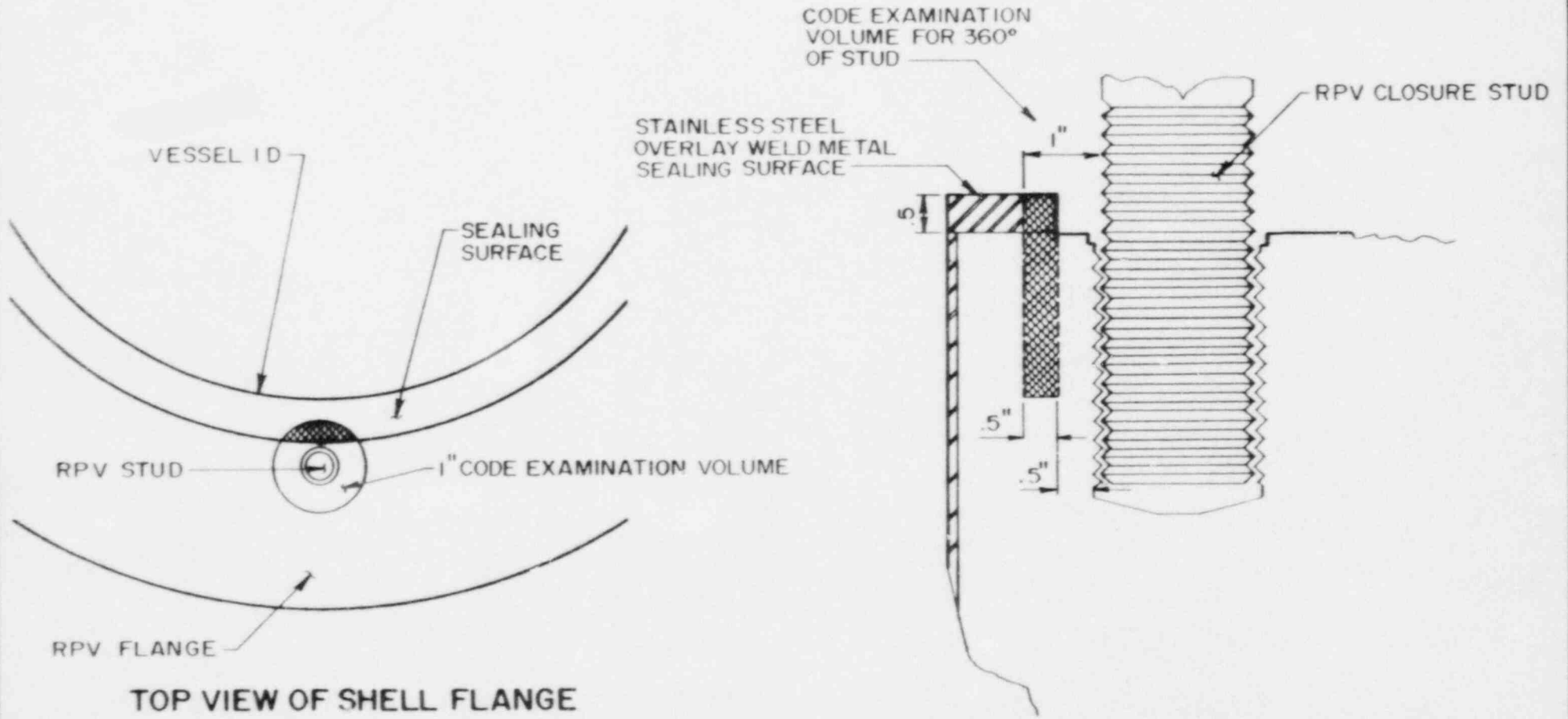



FIGURE 2

CROSS SECTION VIEW OF RPV FLANGE

 UNABLE TO SCAN FULL 1" CIRCLE AROUND STUD HOLE