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AUTH.NAME AUTHOR AFFILIATION
HUNTER,R.S. Indiana & Michigan Electric Co.
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DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards addl info re inservice insp weld program, in response to NRC 820405 ltr.

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INDIANA & MICHIGAN ELECTRIC COMPANY

P. O. BOX 18
BOWLING GREEN STATION
NEW YORK, N. Y. 10004

July 2, 1982
AEP:NRC:00070F

Donald C. Cook Nuclear Plant Units No. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
INSERVICE INSPECTION PROGRAM

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Denton:

This letter and its Attachments respond to Mr. Varga's letter of April 5, 1982, which requested additional information on the Inservice Inspection (ISI) Weld Program for the Donald C. Cook Nuclear Plant Unit Nos. 1 and 2.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to insure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

R. S. Hunter
Vice President

RSH/os

cc: John E. Dolan - Columbus
R. W. Jurgensen
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
Joe Williams, Jr.
NRC Resident Inspector at Cook Plant - Bridgman

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ADDITIONAL INFORMATION ON INSERVICE INSPECTION PROGRAM

ATTACHMENT TO AEP:NRC:00070F

The following are Indiana & Michigan Electric Company's responses to the items noted in Mr. Varga's letter of April 5, 1982. Reference numbers noted in this attachment are the same as in the attachment to Mr. Varga's letter.

RESPONSE TO ITEM 1

(a) The list of exemptions for ASME Class 2 welds has been reviewed and they are not complete and not up to date. A number of changes to the exemptions is required, and these are being made to Table 1, "Components and Welds in Accordance with Code Requirements". A revised Table 1, together with a revised Table 2, "Components and Welds for Which Code Relief is Being Requested", will be submitted in 60 days.

(b) Exemption (c), "Chemistry Control", IWC-1220 of ASME Section XI-1974, will be deleted from Table 1, and these welds will be incorporated into the ISI program. To determine any necessary relief will, in some cases, require physical inspections during unit outages. We will perform these walk-downs during the 1982 refueling outages which are presently scheduled for July-August for Unit 1 and October-December for Unit 2. We will submit the revisions to the Class 2 ISI program with any necessary relief requests within 60 days of the conclusion of the respective outages.

(c) The original criteria to determine restricted access was based on ultrasonic examination and was, therefore, relatively conservative. Most of these welds can be radiographed for complete coverage and the partial access restriction will be deleted from the remarks column. However, some of these welds do require re-inspection to determine if any access restrictions exist since they are either inside containment or covered by insulation and located in hot, confined areas. Verification of restricted access for these welds will be performed during the 1982 refueling outages. Any relief requests will be submitted within 60 days of the conclusion of the respective outages. The welds listed in Table 1 with restricted access are included in the detailed examination Long Term Plan, and scheduled radiographic examinations have been made. Our preliminary evaluation indicates that remaining access restrictions will be few and should not prevent meeting code requirements for category C-G. Category C-F does not apply to these welds.

(d) Table 1 identifies a number of welds as "saddle to pipe" welds whose inspection was augmented because the welds were not structural. These welds are all of a particular type which is one of the three welds shown on Sketch A of this Attachment. A re-evaluation of these welds indicates that they are pressure retaining welds and should be category C-G requiring volumetric examination. However, volumetric examination is impractical because the fillet weld configuration does not lend itself to UT or RT. Surface examination is the alternate method proposed. These fillet welds have been included in the Long Term Plan for surface examination. Scheduled examinations have been performed. These welds will be transferred from Table 1 to Table 2, and will be identified for Code relief as EX-2A. ("EX-2A- Configuration does not permit volumetric examination. Alternate is surface examination".) These welds are listed in Table U of this attachment.

Please note that this configuration is similar to the branch connections shown in ASME Section XI, Winter 1981 Addenda, IWC-2500-13 for pipe. In this case, the examination method required is also surface.

RESPONSE TO ITEM 2

(a) Table 2 was inappropriately titled "exemption". Table 2 will be re-titled "code relief".

(b) The following is the general response to item 2(b).

Table 2 identifies a number of welds that are inaccessible or whose volumetric examination is impractical. These are unique locations or configurations that were listed for generic exceptions in column Y as EX-2 and EX-3. These configurations are explained below.

i) "Branch connection to saddle" welds are listed in Table 2 and identified under "Category" as C-G and under "Remarks" as "No scan due to configuration", and listed for exempt code EX-2. These welds are all of a particular type which is also shown in Sketch A and listed in Table V.

Category C-G requires volumetric examination which is impractical for this weld configuration. Surface examination is the alternate method proposed. These welds are included in the Long Term Plan for surface examination and scheduled examinations have been performed.These welds will be re-classified as EX-2A in Table 2 when it is revised.

ii) "Branch connection to pipe" welds are covered by a saddle that restricts access. These welds were identified in Table 2; "Remarks" column, as "P-N weld under saddle", and

listed for generic exempt code EX-3. No alternate examination is proposed. These welds are also all of a particular type as shown in Sketch A and listed in Table W.

iii) Containment penetration to pipe welds have restricted access due to a pipe restraint. These welds are identified in Table 2, "Remarks" column, as "covered by restraint", and listed for exempt code EX-2. A surface examination is proposed as an alternate to volumetric examination. These welds are in Unit 1 containment, and they will be inspected during the 1982 refueling outage to re-evaluate the access restrictions. These welds are identified in Table X.

iv) Containment penetration flued head to pipe welds are restricted from access since they are totally enclosed within a sleeve. These welds were identified in Table 2, "Remarks" column, as "within sleeve on penetration", and listed for exempt code EX-3. No alternate examination is proposed. These welds are shown in Sketch B and identified in Table Y.

v) Containment penetration flued head to embeddment sleeve welds have restricted access due to cooling coils welded on either side of the head to sleeve weld. These welds are identified for Unit 1 in Table 2, "Remarks" column, as "axial clearance restricted by cooling coil", and listed for exempt code EX-2. For Unit 2, these welds were listed in Table 1 as C-G without any remarks. These welds are shown in Sketch C and identified in Table Z. A re-evaluation of these welds indicates that they are pipe support welds and should be category C-E-1 requiring a surface examination. These welds will be listed in Table 1 as C-E-1. No code relief is required.

Item 2 (b) of Mr. Vargas's letter requested a summary of welds for which code relief was requested that would: (1) identify and provide the number of welds involved, (2) propose an alternate examination, (3) propose alternate welds for examination and (4) determine how close these measures come to meeting the code. A detailed summary has not been prepared because there are currently only two systems, main steam and feedwater, where code relief is requested. These are due to access restrictions or weld configurations. There are only six distinct cases to be considered. Both systems are comprised of four multiple streams. We are required by IWC-2411 and IWC-2520, C-G, to examine only the equivalent of fifty percent of the total welds in one stream over the plant lifetime. Therefore the number of welds that will not be examined, but which are required to meet the intent of the code is as follows:

Unit 1 only

No.	Weld	Alternate	Reference
One	Penetration to pipe	surface	2(b)(iii)
None *	Pipe to elbow	surface	-

Units 1 and 2

No.**	Weld	Alternate	Reference
Four	Branch connection to saddle	surface	2(b)(i)
Four	Saddle to pipe	surface	1(d)
One	Within penetration embeddment sleeve	none	2(b)(iv)
Four	Branch connection to pipe	none	2(b)(ii)

This number is very small when compared to the number of other welds requiring examination.

* There is only one weld for which code relief is requested, that need not be examined to meet the intent of the code as other welds can be substituted for examination.

** Each Unit

A summary has not been prepared where code relief is being requested, other than for restricted access or weld configuration because the relief request is for systems or portions of systems. The number of welds required to be examined therefore is dependent upon the number of multiple streams and whether or not the system circulates reactor coolant. IWC-2411 and IWC-2520 define the percentage of the welds that must be examined to meet the code.

RESPONSE TO ITEM 3

A review of generic exceptions EX-1 through EX-9 was done. A summary of the results is as follows:

(a) EX-1. This exception was not used.

(b) EX-2. This exception was used for containment penetration to pipe welds "covered by a restraint", "branch connection to saddle" welds, and penetration welds with restricted access due to cooling coils. One

other weld in Table 2 referenced this exception category for code relief due to "axial clearance restricted by hanger and beam".

Criteria for welds restricted by clearance is shown in Figure A.

"Branch connections to saddle welds" are shown on Sketch A. This is a unique weld configuration and was discussed in 2(b)(i).

Penetration welds with restricted access due to cooling coils are shown on Sketch C. They are discussed in 2(b)(v), and exception is no longer required.

(c) EX-3. This exception was used for "branch connection to pipe" welds that are covered by a saddle (Sketch A), and welds within containment penetrations (Sketch B). In all cases it is physically impossible to gain access to the weld to perform nondestructive examination. In no case was "height" or the personnel safety the reason for using this exception.

(d) EX-5. This exception was not used.

(e) EX-7. This exception was used only on Unit 2. Those systems that used EX-7 will be transferred from Table 2 to Table 1, and more appropriately exempted by IWC-1220 (a) or (d). This exception will not be used in the revised Table 2.

(f) EX-8. This exception was not used.

(g) EX-9. This exception was used for containment penetration to expansion joint assembly welds. We have reviewed these welds and have determined that they are support welds which properly belong in Category C-E-1. These welds have been included in the Long Term Plan as C-E-1. They will be transferred to Table 1 and relief is no longer required.

(h) EX-4 and EX-6. EX-6 was not used. EX-4 covered a request for code relief based on MEB 3-1. General Physics Corporation determined, at the time the original Class 2 weld submittal was being prepared, that it was appropriate to seek relief for certain systems based on their expertise and their knowledge of the 1977 Edition of Section XI. The 1974 Edition of the Code in paragraph IWC-1220(a), exempted systems if both design pressure and design temperature were below specified maximum limits. The 1977 Edition eases these requirements by basing the exemption on <u>normal operating</u> pressure and temperature and also by exempting certain

systems which exceeded the specified maximum normal operating pressure and temperature, but were excluded from postulated pipe break design criteria. The concept of Exception 4 was that the exclusion from postulated pipe breaks was applicable to systems which met the classification in NRC Standard Review Plan MEB 3-1 (paragraph B.2.e, footnote 6, page 3.6.2-13, March 1975). This applied to systems which qualified as moderate energy systems and only operate as "high-energy fluid systems" for about 2% of the time that they operate as "moderate-energy fluid systems".

In reviewing Table 2, we found that exceptions EX-10, EX-12 and EX-47 were used inadvertently. EX-10 and EX-12 should have been EX-4 and/or EX-7. EX-47 was used to indicate that both EX-4 and EX-7 apply. We will properly classify them in our revision of Table 2 as discussed in our response to Item 1(a). We will review these newly classified entries to determine if they can be more appropriately transferred to Table 1 for either examination or code exemption. In addition, we plan to review those welds included in Table 2 where relief was requested under EX-4 on a system basis and could appropriately qualify for code exemption and be transferred to Table 1. This will minimize the required number of relief requests.

RESPONSE TO ITEM 4

Class 2 pressure vessels, pumps and valves have been reviewed for the ISI weld program, and no relief requests are anticipated at this time. The Boron Injection Tank was previously exempted by IWC-1220 (c). Since this exemption is no longer allowed, the Boron Injection Tank will be added to the ISI program in accordance with our response to item 1(b).

RESPONSE TO ITEM 5

The submittals referenced in Mr. Varga's letter contain some information on NDE of welds for Class 1 and Class 3 systems. In addition, we have submitted information on our ISI Program for Class 1 systems in the following documents:

a) FSAR, Chapter 4.5, Table 4.5-2 Welds
b) Unit 1, Technical Specifications Appendix A, page 3/4-4-33, Welds.

In the FSAR we pointed out where examination of certain welds was considered to be impractical and suggested alternate methods of examination.

We are reviewing our ISI Program for Class 1 welds and will submit specific requests for relief if required. Based on a scope of work outlined by our consultant this will be submitted within 60 days.

Since Class 3 welds only require pressure testing and not examinations, we are not aware of any relief requests for Class 3 at this time.

RESPONSE TO ITEM 6

(a) This review has resulted in a number of changes to the original Class 2 ISI weld submittal and changes to the code relief requests. There may be additional relief requests generated from the review in progress and as discussed in this attachment.

(b) We are considering combining the ISI Weld program for both Units when the Unit 1 program is updated for the next 10 year interval.

Table U

"Saddle to pipe" welds for which relief is requested

Unit 1		Unit 2	
1-FW-12	40	2-FW-72	36
-10	45	-71	31
-15	40	-73	40
-17	45	-70	42
1-MS-2	24*	2-MS-90	31
-2	27	-90	33
-2	30	-90	35
-2	33	-90	37
-2	36	-90	29
-2	39	-90	27
-7	23 **	-92	37
-7	26	-92	35
-7	29	-92	33
-7	32	-92	31
-7	35	-92	29
-7	38	-92	27
-11	24	-94	37
-11	28	-94	35
-11	30	-94	33
-11	33	-94	31
-11	36	-94	29
-11	39	-94	27
-15	25	-96	35
-15	28	-96	33
-15	31	-96	31
-15	34	-96	29
-15	37	-96	27
-15	40	-96	25

*Weld 24 was incorrectly identified on Table 1, Rev. 0, as 25.
**Weld 23 was incorrectly identified on Table 1, Rev. 0, as 24.

TABLE V

"Branch connection to saddle" welds for which relief is requested.

Unit 1		Unit 2	
1-FW-17	46	2-FW-70	43
15	41	73	41
10	46	72	37
12	41	71	32
1-MS-2	23*	2-MS-90	30
2	26	90	32
2	29	90	34
2	32	90	36
2	35	90	28
2	38	90	26
7	23	92	36
7	25	92	34
7	28	92	32
7	31	92	30
7	34	92	28
7	37	92	26
11	23	94	38
11	27	94	36
11	29	94	34
11	32	94	32
11	35	94	30
11	38	94	28
15	24	96	36
15	27	96	34
15	30	96	32
15	33	96	30
15	36	96	28
15	39	96	26

* Weld 23 was incorrectly identified on Table 2, Rev. 0, as 24.

TABLE W

"Branch connection to pipe" weld covered by a saddle for which relief is requested.

UNIT 1

1-FW-17	44	1-MS-7	39
15	39	7	40
10	44	11	25
12	39	11	31
1-MS-2	25*	11	34
2	28	11	37
2	31	11	40
2	34	11	41
2	37	15	26
2	40	15	29
7	27	15	32
7	30	15	35
7	33	15	38
7	36	15	41

UNIT 2

2-FW-70	41	2-MS-92	15F
73	39	92	14F
72	35	94	20F
71	30	94	19F
2-MS-90	15F	94	18F
90	16F	94	17F
90	17F	94	16F
90	18F	94	15F
90	14F	96	18F
90	13F	96	17F
92	19F	96	15F
92	18F	96	14F
92	17F	96	13F
92	16F	96	16F**

*Weld 25 was incorrectly identified as Weld 41 on Table 2, Rev. 0. 1-MS-2,Weld 41, listed on Table 2, Rev. 0 as P-N weld covered by saddle appears to be incorrectly identified.. It will be checked during the next refuelling outage.

**Weld 16 was incorrectly listed on Table 1, Rev. 2.

TABLE X

Containment penetration to pipe welds that have restricted access due to a pipe restraint for which relief is requested.

Unit 1

1-MS-1	10F
1-MS-6	10F
1-MS-10	09F
1-MS-14	09F

TABLE .Y

Containment penetration to pipe weld that is covered by a concrete embeddment sleeve for which code relief is requested.

Unit 1	Unit 2
1-FW-18 01F	2-FW-77 15F
1-FW-16 01F	2-FW-74 16F
1-FW-11 01F	2-FW-75 16F
1-FW-13 01F	2-FW-76 16F
1-MS-1 12F	2-MS-89 13F
1-MS-6 12F	2-MS-91 11F
1-MS-10 11F	2-MS-93 11F
1-MS-14 11F	2-MS-95 11F

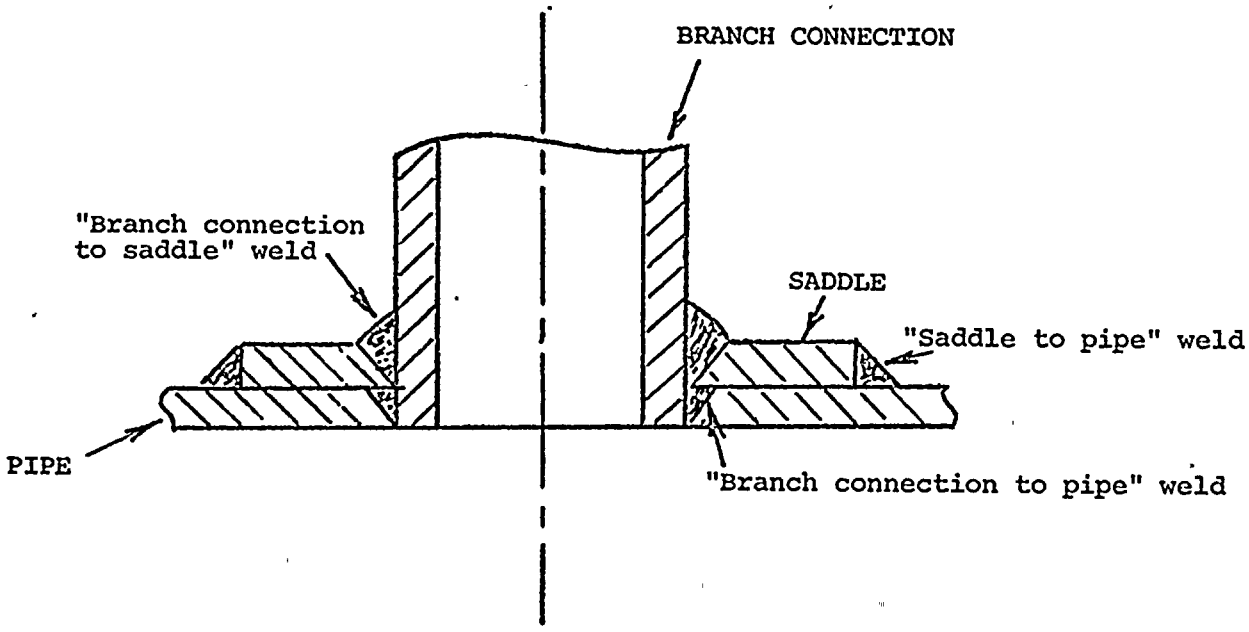
TABLE Z

Penetration flued head to penetration pipe embeddment sleeve butt welds that have restricted access due to cooling coils.

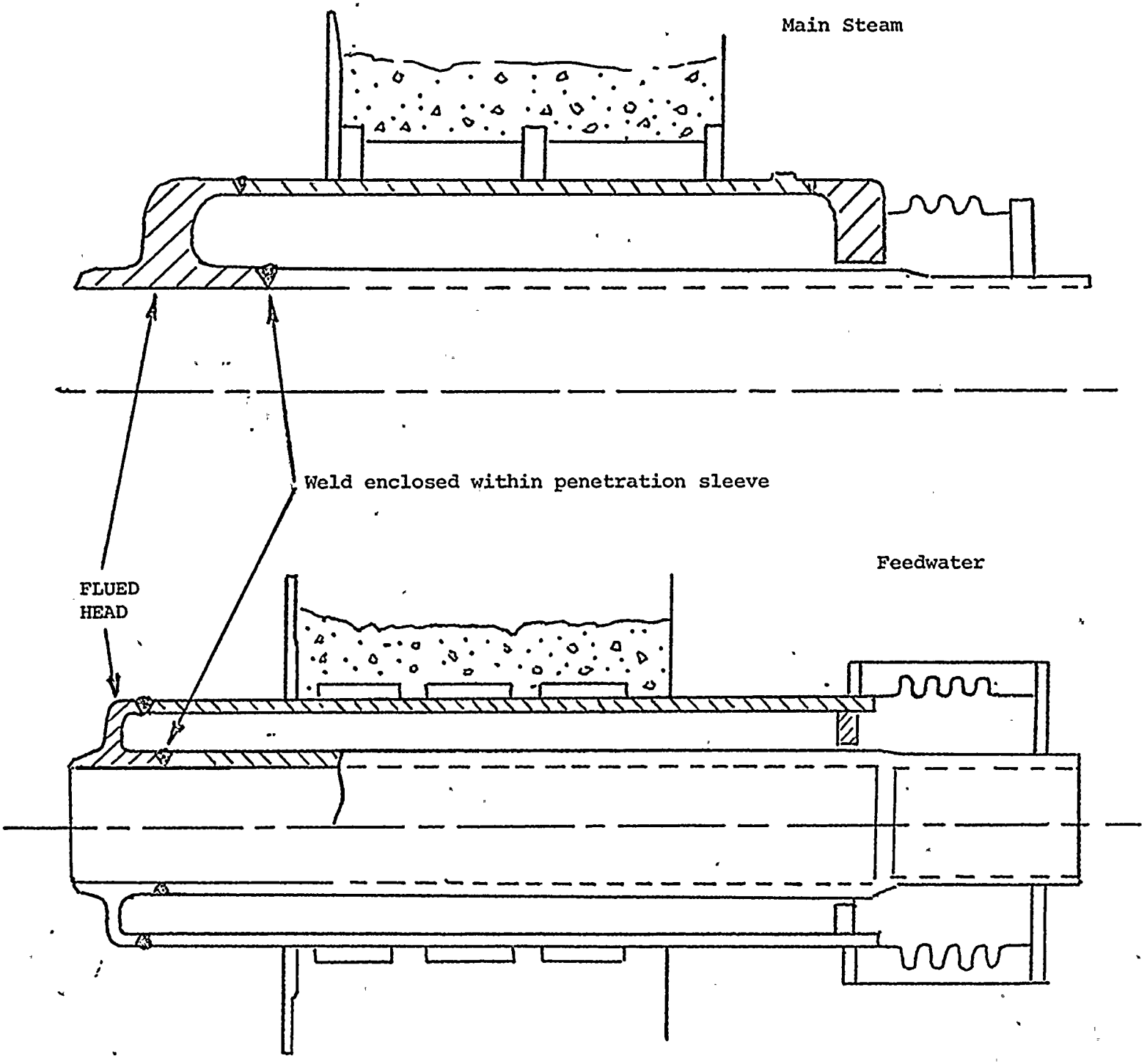
Unit 1		Unit 2	
1-MS-1	11F	2-MS-89	12S
-6	11F	-91	10S
-10	10F	-93	10S
-14	10F	-95	10F

Sketch A

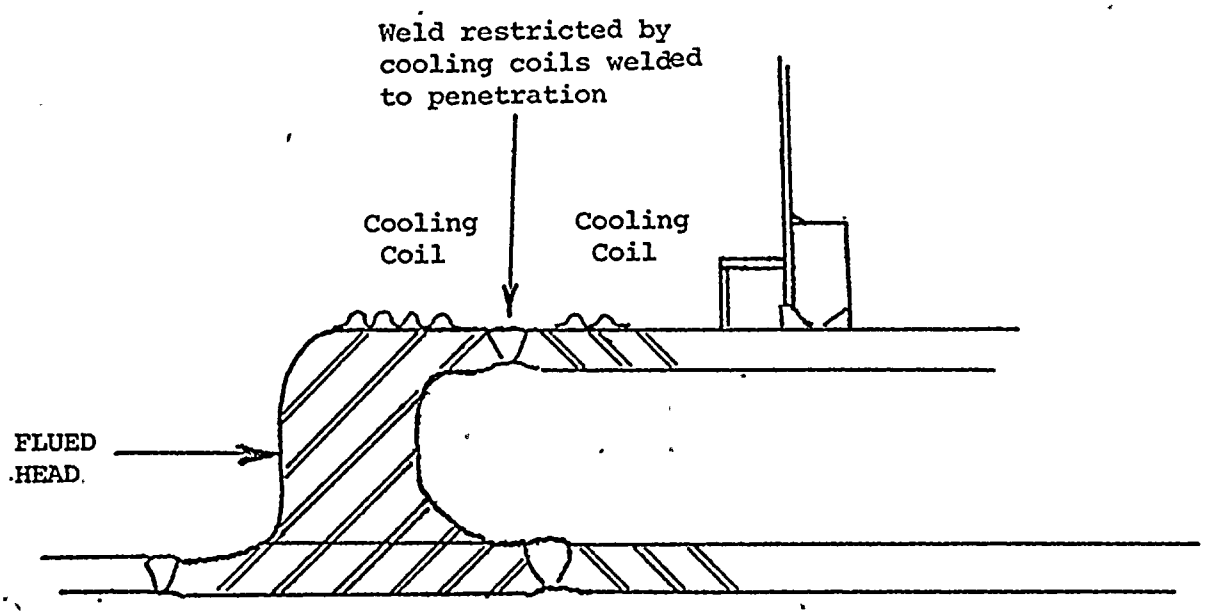
Branch Connection Fabrication Detail



Sketch B


Main Steam
Weld enclosed within penetration sleeve
Feedwater
FLUED
HEAD

SKETCH C

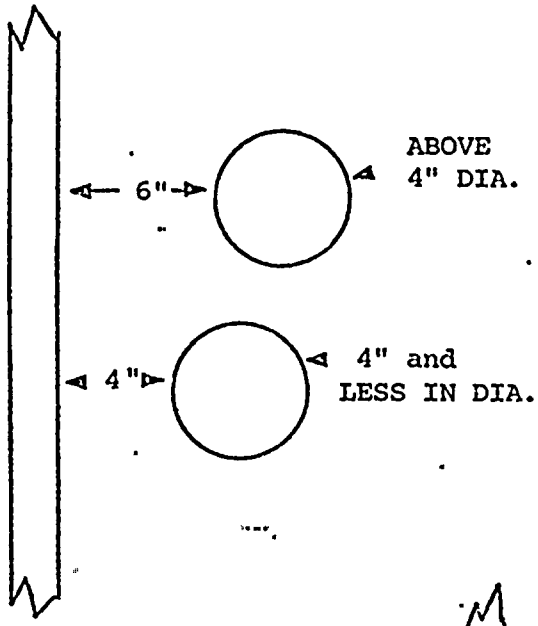


Cooling Coils on Main Steam Penetration

FIGURE A
GENERAL PHYSICS CORP. CRITERIA

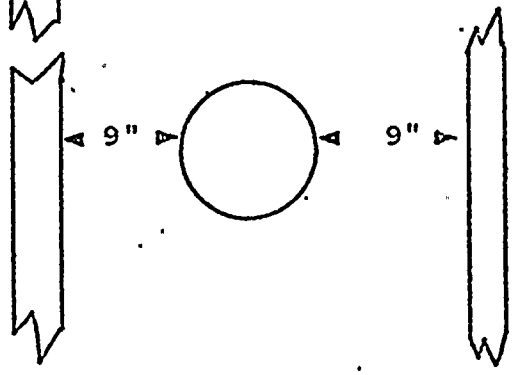
Piping to be inspected manually should be located in such a manner as to allow personnel conducting ultrasonic examination sufficient access to perform a meaningful and complete examination. Direct access is required to place the head and shoulders within 20" of the area being examined. Access around the component being examined must be sufficient to manipulate the hand and a transducer approximately 1-1/2" in diameter and 3" long. The following figures depict layout configurations which provide the necessary access. All dimensions listed are with insulation removed.

Figure 1



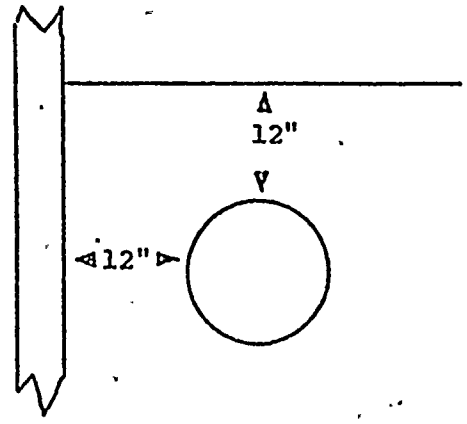
When access restrictions exist on one side only, 6" minimum clearance is required for piping greater than 4" dia. For piping 4" dia. or less the minimum clearance may be reduced to 4".

Figure 2



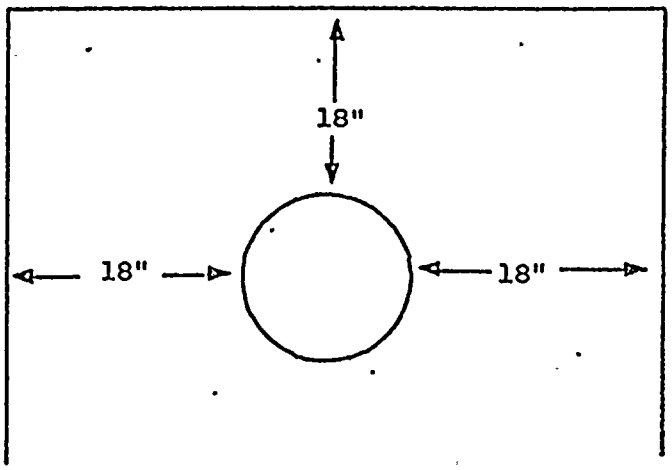
When access restrictions exist on 2 opposite sides, 9" minimum clearance is required.

Figure 3



When access restrictions exist on 2 adjacent sides, 12" minimum clearance is required.

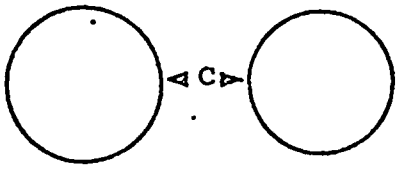
Figure 4



When access restrictions exist on 3 adjacent sides, 18" minimum clearance is required.

The restrictions shown above are rigid obstructions such as walls, ventilation ducts, electrical conduit, etc., that run the length of the pipe for a distance greater than 1 foot on both sides of the weld. Restrictions of this type are prohibited on all 4 sides of the pipe; if, however, welds must be placed in tunnels, pipe chase, etc., welds should be 12" or less from an opening. For restrictions resulting from parallel pipe lines, the following minimum clearances should be provided between lines.

Figure 5



Pipe Diameter	Clearance
up to 4" Dia.	3"
4" to 6" Dia.	4"
6" to 8" Dia.	6"
8" and Above	9"

When parallel pipes are of different diameters, then clearance requirements for the large size applies.

Where no restriction is shown, the minimum clearance is assumed to be 24". Piping which is located 60" or more above a floor will require clearance for scaffolding and/or ladders as required to reach welds.