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Closeout of IE Bulletin 80-08: Examination of Containment Liner Penetration Welds

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PARAMETER, Inc.

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NRC FIN B1013

ABSTRACT

During an NRC inspection at Nine Mile Point 2, examination by radiography of primary containment liner penetration sleeve-to-process pipe (flued head fitting) welds revealed rejectable defects not originally found by ultrasonic examination. Apparently, ultrasonic signals from the weld backing bar masked signals from defects. Further investigation found similar problems at Beaver Valley 2 and North Anna 3 and 4. IE Bulletin 80-08 was issued to acquire information from all facilities to determine the generic nature of the problem. It was found that, because of evolution of the ASME Nuclear Code, plants under construction designed to that Code since about 1974 are required to volumetrically examine these welds, and so, in general, do not have the problem. Operating plants, built to earlier codes not requiring such design and examination for the containment welds, present a concern for the quality of this type of weld and for the integrity of the primary containment boundary. Bulletin status is closed for all but 11 facilities. Recommendations are made for resolution of the problem for these facilities. These include meaningful radiographic examination of welds of concern, if possible, and if not, licensee justification for not making a radiographic examination.

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CLOSEOUT OF IE BULLETIN 80-08: EXAMINATION OF CONTAINMENT LINER PENETRATION WELDS

Introduction

IE Bulletin 80-08 was issued as a result of finding primary containment liner penetration weld defects during an NRC inspection at one facility and subsequent followup investigations at other facilities for similar weld defects. The purpose of the Bulletin was to acquire information from all units to determine the generic impact of the problem.

This report is based on the collection of the information acquired from NRC Headquarters files of facility responses to the Bulletin and inspection reports. Its purpose is to determine the closeout status of the Bulletin for all facilities, to point out remaining areas of concern, and to present proposals for futher action to complete the closeout of the Bulletin. No solicitation was made for additional information from Regional offices. This report has been prepared in accordance with Task Order 16 under Contract NRC-05-80-251.

Criteria for closeout of the Bulletin are given in the text of the report. A summary section presents overall statistics of Bulletin status. Facilities with closed status and facilities with open status are listed. Recommendations offer a general plan to assist in resolving the remaining areas of concern.

A copy of the Bulletin and a copy of Figure NE-1120-1 from Section III of the ASME Nuclear Code, which shows the Type (c) penetration butt weld joint detail of concern, are included in Appendix A. Also included in Appendix A is a background section explaining the safety significance of the weld deficiencies, as well as presenting the history of the problem which led to the issuance of the Bulletin. Differences in the resulting concerns between older operating plants and those still under construction are discussed.

Appendix B consists of the complete tabulation summary of Bulletin responses for all facilities except those cancelled and not responding. Bulletin status is given for each facility.

In Appendix C, a tabulation by Regions of facilities with Bulletin status remaining open is given. Pertinent data and remarks for each facility are included to make a working summary sheet for use in followup.

Salient Actions Required by the Bulletin

The Bulletin requested actions of all facilities primarily to gather information and details of each plant's fabrication and installation. The copy of the Bulletin in Appendix A should be referred to for these specific actions.

Criteria for Bulletin Status

The Bulletin is to be closed for facilities to which one of the following criteria applies.

1. A facility which has been cancelled, for which construction has been halted, or which has been shut down indefinitely.

2. A facility for which an acceptable response has been submitted which indicates that the facility has no containment penetration butt welded joints of the type addressed in Bulletin 80-08.

3. A facility for which an acceptable response has been submitted which indicates that, during construction, weld joints of concern were, or will be, examined volumetrically by radiography (RT), or, by ultrasonics (UT) if welds have no backing bar.

4. A facility for which an acceptable response has been submitted which indicates that weld joints of concern are of acceptable quality as determined by re-examination by radiography (RT) or by ultrasonics (UT) if welds have no backing bar. Bulletin closure for this criterion also requires that IE inspectors verify weld examination records.

5. A facility for which an acceptable response indicates that, in the Final Safety Analysis Report (FSAR), no commitment was made for volumetric examination of the weld joints of the type addressed in Bulletin 80-08.

Summary of Responses

1. The table of response information in Appendix B lists 165 facilities. Thirty-five facilities in the list are cancelled, shut down for an indefinite period, or have had construction halted for an indefinite time, and so have closed Bulletin status per Criterion 1.

2. Of the 130 active facilities, 123 are reported to have butt welded design penetrations of concern. The seven that do not have the butt weld design have closed Bulletin status per Criterion 2, and are listed as follows:

Crystal River 3	Robinson 2
Ginna	Three Mile Island 1
Indian Point 2, 3	Yankee-Rowe 1

3. Ninety-one facililties have closed Bulletin status based on Criterion 3.

4. Bulletin status is closed for the following three facilities per Criterion 4:

   Beaver Valley 2
   Millstone 3
   Nine Mile Point 2

5. Bulletin status is closed for the following 18 facilities per Criterion 5:

Beaver Valley 1	Haddam Neck	Pilgrim 1
Big Rock Point 1	LaCrosse	Point Beach 1, 2
Cooper Station	Maine Yankee	Shoreham
FitzPatrick	North Anna 1, 2	Surry 1, 2
Ft. Calhoun 1	Palisades	Vermont Yankee 1

6. Eleven facilities have open Bulletin status, and are listed by Regions below as well as in Appendix C. Followup of these facilities is recommended.

Region I	Region II	Region III
Oyster Creek 1	Brunswick 1, 2	Monticello
Salem 1, 2	Hatch 1, 2	Prairie Island 1
	St. Lucie 1	
	Turkey Point 3	

Remaining Areas of Concern

The particular penetration butt weld design of remaining concern is defined more specifically by the following description:

a. It joins a flued head to the penetration sleeve similarly to that shown by Figure NE-1112-1(c) of the ASME Code, Section III, included for reference on Page A-3 of this report.

b. The penetration contains high energy steam or water piping.

   High energy fluid systems are defined in NRC Branch Technical Position ASB 3-1 as systems that are normally operated or maintained pressurized under either or both of the following conditions:

   (1) Maximum operating temperature exceeds 200 degrees F;
   (2) Maximum operating pressure exceeds 275 psi.

c. The piping has a butt weld within the penetration sleeve, inaccessible for inservice inspection.

Facilities within the remaining areas of concern are in three groups described as follows:

1. Plants for which no volumetric examination was used on all or some of the butt-welded penetrations, with or without backing bars, or for which records of volumetric examination results have not been found:

Region I	Region II	Region III
Oyster Creek 1	Hatch 1	Monticello
Salem 1, 2		

2. Plants for which UT was used for examination of butt welds with backing bars:

Region II	Region III
Brunswick 1, 2	Prairie Island 1
Hatch 2	
St. Lucie 1	

3. One plant for which inspection verification of re-examination and repair of one butt weld is recommended: Region II, Turkey Point 3.

Recommendations

Listed are recommendations for a general plan to resolve the remaining areas of concern. Recommendations 1 and 2 apply respectively to Groups 1 and 2 of plants in "Remaining Areas of Concern." Note that the particular butt weld design of remaining concern is defined specifically in "Remaining Areas of Concern."

1. For the older, operating plants with all or some penetration sleeve butt welds not examined volumetrically:

   1.1 Those penetration butt welds which were not radiographed during acceptance examination should be reviewed by the licensee to determine if they are the design described in "Remaining Areas of Concern," and if a radiographic examination is physically possible.

   1.2 Those welds whose configuration will allow meaningful radiographic examination should be scheduled by the licensee for such an examination and appropriate repair during the next scheduled outage.

1.3 For those welds where a meaningful radiographic examination cannot be made, full justification for not making the examination should be presented by the licensee. Such justification could stem from a review of weld design, since these plants were designed and constructed to codes allowing welds without volumetric examination where, in the design, wall thicknesses were chosen using low weld efficiency factors.

1.4 The results of the examinations of 1.2, and the justifications of 1.3, should be identified by penetration number, size, piping system, and otherwise as required for full identification. The results should be reviewed and evaluated by cognizant licensee engineers, and then submitted to NRC/IE with this evaluation for final resolution.

2. At Hatch 2, Brunswick 1 and 2, St. Lucie 1, and Prairie Island 1, the flued head design with backing ring, examined by UT, is used. However, at each location, welds of this type and examination that could be radiographed were so examined and found acceptable. The concern is, does this examination of welds prove out similar welds in the same plant where RT is not possible? Whether or not this is acceptable is a judgment requiring review by cognizant engineers. Individual welds should be identified by the licensee, using a procedure similar to 1.4, and the results and evaluation should be submitted to NRC/IE for final resolution.

Influence of Safety Guide 19(Regulatory Guide 1.19)(Reference 3)

Safety Guide 19 (R.G. 1.19) was issued in December of 1971 to describe acceptable procedures for nondestructive examination of containment liner and penetration welds, a subject not covered previously by applicable industry codes. At that same time, however, Section III of the ASME Boiler and Pressure Vessel Code was altered to provide this coverage. Utility responses for facilities built to Section III, 1971 or later, indicate that volumetric examination of these welds was required, whether or not the construction also was committed to Safety Guide 19.

References

1. United States Nuclear Regulatory Commission, Licensed Operating Reactors, Status Summary Report, Data as of 11-30-83, Volume 7, No. 12. December, 1983.

2. United States Nuclear Regulatory Commission, Nuclear Power Plants, Construction Status Report, Data as of 06-30-82, NUREG-0030, Volume 6, No. 2, October, 1982.

3. United States Nuclear Regulatory Commission, Nondestructive Examination of Primary Containment Liner Welds, Safety Guide 19, Revision 1, August 11, 1972.

APPENDIX A

IE Bulletin 80-08
Figure NE-1120-1 from ASME B&PV Code, Section III
Background

SSINS No.: 6820
Accessions No.:
7912190650

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

IE Bulletin No. 80-08
Date: April 7, 1980

EXAMINATION OF CONTAINMENT LINER PENETRATION WELDS

Description of Circumstances:

On March 20-23, 1979, an NRC inspection at Nine Mile Point Unit 2, identified that certain nondestructive examinations performed on containment penetration welds did not satisfy the applicable ASME Boiler and Pressure Vessel (B&PV) Code requirements. The welds in question were the primary piping containment penetration flued head (integral fitting) to outer sleeve welds which form a part of the containment pressure boundary. The examinations performed included ultrasonic and surface inspections of the outer surface.

Subsequent to the identification of this code problem at Nine Mile Point Unit 2, three welds previously found to be acceptable using ultrasonics were radiographed and two revealed indications in excess of the code allowable. The indications revealed by radiography were slag and lack-of-fusion. Preliminary NRC review indicates that the probable reason the indications were not detected by ultrasonics was due to masking from signals received from the backing bar. As a result of these findings, a complete re-examination program at Nine Mile Point Unit 2 was initiated wherein 10 of 17 welds previously examined and found to be acceptable using ultrasonics, were re-examined by radiography before rework and found to have indications exceeding ASME Code allowables.

Additional information concerning Beaver Valley Unit 2 and North Anna 3 and 4 has also shown cases of flued head piping penetration weld defects exceeding ASME B&PV Code acceptance criteria when radiographed. Original approved vendor procedures at Beaver Valley Unit 2 did not require volumetric examination. Radiography for information purposes disclosed the unacceptable indications at North Anna 3 and 4. Specification deficiencies have also been discovered at Millstone 3 and River Bend where radiography of these welds was not required.

The ASME B&PV Code requires radiography of the subject welds with specified exceptions. The licensees and their architect engineer (Stone and Webster) had specified ultrasonics as the volumetric examination method because, in their judgement, radiography was impractical for the penetration geometry. Radiography was successfully performed at North Anna 3 and 4 prior to the identification of this problem and at Beaver Valley 2 and Nine Mile Point 2 subsequent to NRC inspections. This experience indicates that radiography was meaningful and more practical than UT examination of these penetration welds when backing bars are present.

Action to be Taken by Licensee:

For all power reactor facilities with an operating license or a construction permit:

1. Determine if your facility contains the flued head design for penetration connections, or other designs with containment boundary butt weld(s) between the penetration sleeve and process piping as illustrated in Figure NE 1120-1, Winter 1975 Addenda to the 1974 and later editions of the ASME B&PV Code.

2. If an affirmative answer is reached for Item 1, determine the following:

   a. Applicability of the ASME Code including year and addenda and/or Regulatory Guide 1.19,

   b. Type of nondestructive examinations performed during construction,

   c. Type of weld joint (including pipe material and size) and whether or not backing bars were used,

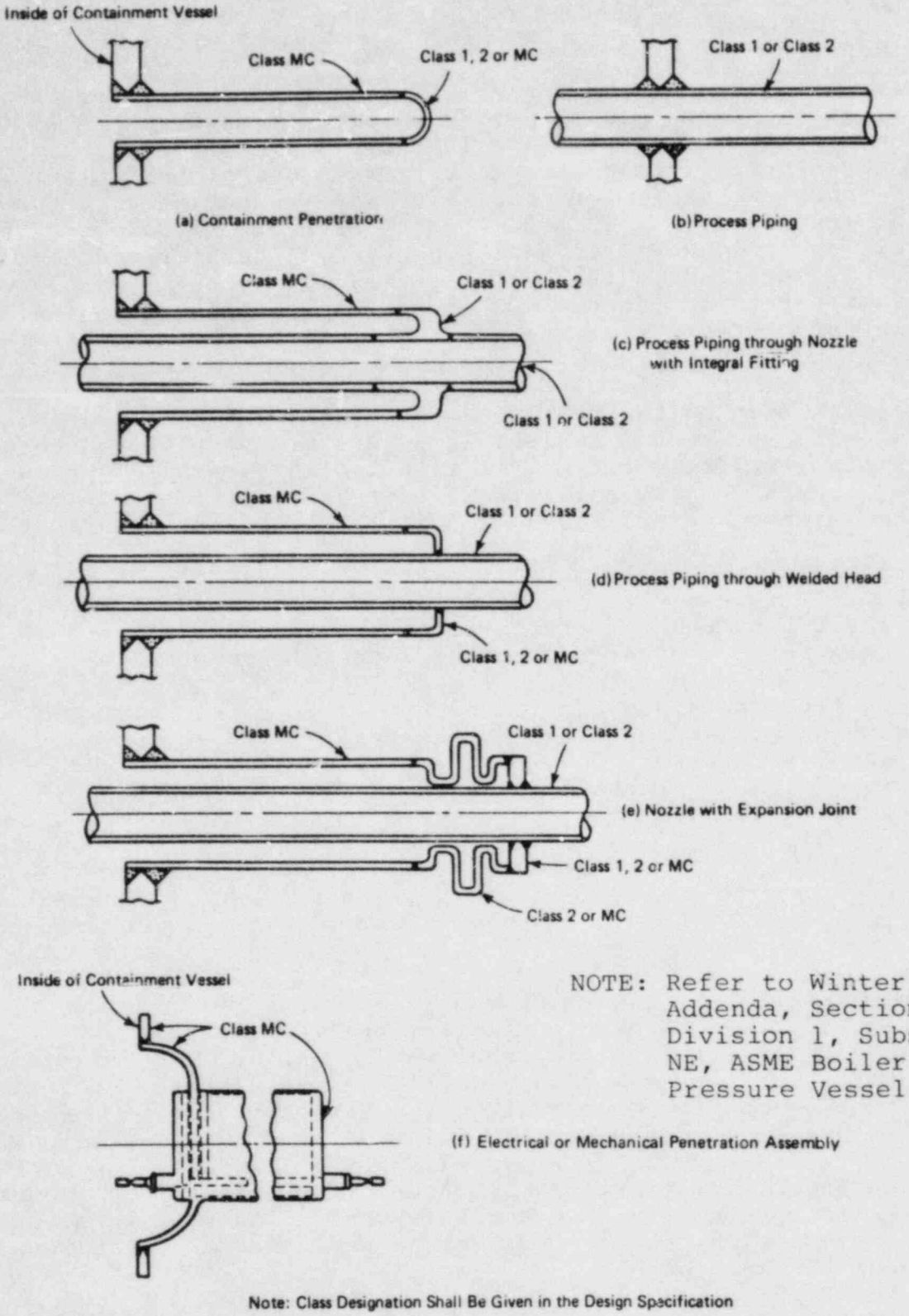
   d. Results of construction nondestructive examinations, i.e., if repairs were required, this should be identified including extent of repairs and description of defects encountered during repair; if known.

3. For those facilities committed during construction to perform volumetric examination of such penetrations through SAR commitments which have not performed radiography, justify not performing radiography or submit plans and schedules for performing radiographic examinations.

Within 90 days of the date of this Bulletin, facilities with an operating license or a construction permit shall submit the information requested in Items 1, 2, and 3 of this Bulletin.

Reports shall be submitted to the Regional Director with a copy to the Director, Division of Reactor Construction Inspection, Washington, D. C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.



NOTE: Refer to Winter 1975 Addenda, Section III, Division 1, Subsection NE, ASME Boiler and Pressure Vessel Code.

Note: Class Designation Shall Be Given in the Design Specification

FIG. NE-1120-1 TYPICAL CONTAINMENT PENETRATIONS

Background

Developing concern in the government and industry for the integrity of containment welds resulted, in the early 1970's, in the issuing of Safety Guide 19 (Regulatory Guide 1.19), "Nondestructive Examination of Primary Containment Liner Welds." At about the same time, the inservice inspection portions of Section III of the ASME Boiler and Pressure Vessel Code were developed and began to be implemented. Therefore, nuclear plants designed to the Code (Section III) since this period are committed to volumetric NDE of primary containment welds, and the safety considerations for containment leak integrity are under adequate control.

An exception to the previous statement was discovered in 1979 regarding penetration sleeve-to-process-piping (flued head fitting) welds, where examination by radiograph (RT) showed rejectable defects not identified by earlier ultrasonic examination (UT) of the same joints. This was in a plant (Nine Mile Point 2) designed to the codes of about the period mentioned in the previous paragraph. Investigation identified that UT signals from the weld backing bar could have masked signals from the rejectable defects. Investigation in other plants found similar situations with this penetration design.

This flued head penetration design is of particular safety concern because the Class MC penetration sleeve encloses the Class 1 or Class 2 process pipe-to-flued head butt weld (see copy of ASME Section III, Figure NE-1120-1(c) on Page A-3), making it inaccessible for inservice inspection. Failure of the process pipe weld, especially where the piping contains high energy steam or water, would result in local pressure loading of the nearby containment sleeve butt weld. Quality monitoring of this sleeve weld, then, becomes essential to the containment integrity.

These events and situation analyses led to the issuance of IE Bulletin 80-08 to gather information from all units to determine the generic impact of the problem. A copy of the Bulletin is included in Appendix A, and it gives further details of the situation at Nine Mile Point 2 and the other plants investigated previous to issuance of the Bulletin.

In general, for plants still under construction where the butt joint design and backing bar exit, and welds were examined ultrasonically, radiography can be performed to clear doubts about the weld adequacy.

However, such action poses special problems for operating plants and those at an advanced state of construction. Some of the arrangements and details of the piping systems and components were designed and fabricated before access and examination requirements of Section III of the ASME B&PV Code could be applied.

Consequently, some examinations are limited or are not practical because of geometric configuration or accessibility. Generally, these limitations exist where geometry and sometimes surface condition preclude meaningful RT to be achieved. Accessibility for radiography is blocked by installed thermal insulation and/or pipe whip restraints in many cases.

APPENDIX B

Tabulation of Bulletin Status

APPENDIX B

Tabulation of Bulletin Status

Facility	Utility	Docket No.	Fac. St.[a]	NRC Reg.	NSSS Supp.	Arch. Engr.	Response Date	Butt Weld[b]	ASME Code[c]	Bkg. Bar	NDE[d]	Bulletin Status[e]
Arkansas 1	AP&L	50-313	OL	IV	B&W	Bechtel	06/27/80	Yes	31.7-69	No	RT	Closed(3)
Arkansas 2	AP&L	50-368	OL	IV	C-E	Bechtel	06/27/80	Yes	III-S74	No	RT	Closed(3)
Bailly 1	NIPSCO	50-367	CD	III	GE	S&L	08/14/80					Closed(1)
Beaver Valley 1	DL	50-334	OL	I	W	S&W	07/15/80	Yes	III-68	Yes	ST	Closed(5)[f]
Beaver Valley 2	DL	50-412	CP	I	W	S&W	07/09/80	Yes	III-W72	Yes	ST	Closed(4)
Bellefonte 1	TVA	50-438	CP	II	B&W	TVA	07/08/80	Yes	III-75	No	RT,UT	Closed(3)
Bellefonte 2	TVA	50-439	CP	II	B&W	TVA	07/08/80	Yes	III-75	No	RT,UT	Closed(3)
Big Rock Point 1	CP	50-155	OL	III	GE	Bechtel	07/09/80	Yes	VIII-59	Yes	None	Closed(5)
Black Fox 1	PSCO	50-556	CD	IV	GE	B&V						Closed(1)
Black Fox 2	PSCO	50-557	CD	IV	GE	B&V						Closed(1)
Braidwood 1	CECO	50-456	CP	III	W	S&L	07/09/80 08/15/80	Yes	III-S75	Yes	RT	Closed(3)
Braidwood 2	CECO	50-457	CP	III	W	S&L	07/09/80 08/15/80	Yes	III-S75	Yes	RT	Closed(3)
Browns Ferry 1	TVA	50-259	OL	II	GE	TVA	07/07/80	Yes	III-65	Yes	RT	Closed(3)
Browns Ferry 2	TVA	50-260	OL	II	GE	TVA	08/07/81	Yes	III-65	Yes	RT	Closed(3)
Browns Ferry 3	TVA	50-296	OL	II	GE	TVA	01/29/82	Yes	III-65	Yes	RT	Closed(3)
Brunswick 1	CP&L	50-325	OL	II	GE	UE&C	07/03/80 07/29/81	Yes	III-S67	Yes	RT,UT	Open
Brunswick 2	CP&L	50-324	OL	II	GE	UE&C	07/03/80 07/29/81	Yes	III-S67	Yes	RT,UT	Open
Byron 1	CECO	50-454	CP	III	W	S&L	07/09/80 08/15/80	Yes	III-S75	Yes	RT	Closed(3)
Byron 2	CECO	50-455	CP	III	W	S&L	07/09/80 08/15/80	Yes	III-S75	Yes	RT	Closed(3)
Callaway 1	UE	50-483	CP	III	W	Bechtel	07/01/80	Yes	III-S75	No	RT	Closed(3)
Callaway 2	UE	50-486	CD	III	W	Bechtel	07/01/80					Closed(1)
Calvert Cliffs 1	BG&E	50-317	OL	I	C-E	Bechtel	07/03/80	Yes	III-S69	No	RT,UT	Closed(3)
Calvert Cliffs 2	BG&E	50-318	OL	I	C-E	Bechtel	07/03/80	Yes	III-S69	No	RT,UT	Closed(3)

See footnotes at end of table.

Facility	Utility	Docket No.	Fac. St.[a]	NRC Req.	NSSS Supp.	Arch. Engr.	Response Date	Butt Weld[b]	ASME Code[c]	Bkg. Bar	NDE[d]	Bulletin Status[e]
Catawba 1	DUPCO	50-413	CP	II	W	DUPCO	07/07/80	Yes	III-S74	No	UT	Closed(3)
Catawba 2	DUPCO	50-414	CP	II	W	DUPCO	07/07/80	Yes	III-S74	No	UT	Closed(3)
Cherokee 1	DUPCO	50-491	CH	II	C-E	DUPCO	07/07/80					Closed(1)
Cherokee 2	DUPCO	50-492	CH	II	C-E	DUPCO	07/07/80					Closed(1)
Cherokee 3	DUPCO	50-493	CH	II	C-E	DUPCO	07/07/80					Closed(1)
Clinton 1	IP	50-461	CP	III	GE	S&L	07/03/80	Yes	III-S74	Yes	RT	Closed(3)
Clinton 2	IP	50-462	CH	III	GE	S&L	07/03/80					Closed(1)
Comanche Peak 1	TUGCO	50-445	CP	IV	W	G&H	06/27/80	Yes	III-S76	No	RT	Closed(3)
Comanche Peak 2	TUGCO	50-446	CP	IV	W	G&H	06/27/80	Yes	III-S76	No	RT	Closed(3)
Cook 1	IMECO	50-315	OL	III	W	AEPSCO	07/09/80	Yes	III-68	No	RT	Closed(3)
Cook 2	IMECO	50-316	OL	III	W	AEPSCO	07/09/80	Yes	III-68	No	RT	Closed(3)
Cooper Station	NPPD	50-298	OL	IV	GE	B&R	07/08/80	Yes	III-W67	Yes	ST	Closed(5)
Crystal River 3	FP	50-302	OL	II	B&W	Gilbert	06/12/80	No				Closed(2)
Davis-Besse 1	TECO	50-346	OL	III	B&W	Bechtel	07/10/80	Yes	III-71	No	RT	Closed(3)
Diablo Canyon 1	PG&E	50-275	CP	V	W	PG&E	06/18/80	Yes	VIII-S68	No	RT	Closed(3)
Diablo Canyon 2	PG&E	50-323	CP	V	W	PG&E	06/18/80	Yes	VIII-S68	No	RT	Closed(3)
Dresden 1	CECO	50-10	SDI	III	GE	Bechtel	07/09/80 08/15/80					Closed(1)
Dresden 2	CECO	50-237	OL	III	GE	S&L	07/09/80 08/15/80	Yes	III-S65	No	RT	Closed(3)
Dresden 3	CECO	50-249	OL	III	GE	S&L	07/09/80 08/15/80	Yes	III-S65	No	RT	Closed(3)
Duane Arnold	IELPCO	50-331	OL	III	GE	Bechtel	07/08/80	Yes	B31.7	No	RT,UT	Closed(3)
Farley 1	APCO	50-348	OL	II	W	Bechtel	07/01/80	Yes	III-S71	No	RT	Closed(3)
Farley 2	APCO	50-364	OL	II	W	Bechtel	07/01/80	Yes	III-S71	No	RT	Closed(3)
Fermi 2	DECO	50-341	CP	III	GE	DECO	07/07/80 02/12/81	Yes	III-W72	Yes	RT	Closed(3)
FitzPatrick	PASNY	50-333	OL	I	GE	S&W	07/03/80 05/01/81	Yes	III-S68	No	ST	Closed(5)
Forked River	JCP&L	50-363	CD	I	C-E	B&R						Closed(1)
Fort Calhoun 1	OPPD	50-285	OL	IV	C-E	G&H	07/03/80	Yes	III-W69	No	ST	Closed(5)
Fort St. Vrain	PSCC	50-267	OL	IV	GA	S&L	07/02/80	Yes	III-W66	1	RT	Closed(3)
Ginna	RG&E	50-244	OL	I	W	Gilbert	05/29/80	No				Closed(2)
Grand Gulf 1	MP&L	50-416	LPT	II	GE	Bechtel	08/21/80 10/15/80	Yes	III-S74	No	RT	Closed(3)

See footnotes at end of table.

Facility	Utility	Docket No.	Fac. St.[a]	NRC Reg.	NSSS Supp.	Arch. Engr.	Response Date	Butt Weld[b]	ASME Code[c]	Bkg. Bar	NDE[d]	Bulletin Status[e]
Grand Gulf 2	MP&L	50-417	CH	II	GE	Bechtel	09/21/80 10/15/80					Closed(1)
Haddam Neck	CYAPCO	50-213	OL	I	W	S&W	06/19/80	Yes	31.1-55	Yes	RT	Closed(5)
Harris 1	CP&L	50-400	CP	II	W	Ebasco	07/02/80	Yes	III-W76	k	RT	Closed(3)
Harris 2	CP&L	50-401	CP	II	W	Ebasco	07/02/80	Yes	III-W76	k	RT	Closed(3)
Harris 3	CP&L	50-402	CP	II	W	Ebasco	07/02/80					Closed(1)
Harris 4	CP&L	50-403	CP	II	W	Ebasco	07/02/80					Closed(1)
Hartsville A-1	TVA	50-518	CH	II	GE	TVA	07/07/80					Closed(1)
Hartsville A-2	TVA	50-519	CH	II	GE	TVA	07/07/80					Closed(1)
Hartsville B-1	TVA	50-520	CH	II	GE	TVA	07/07/80					Closed(1)
Hartsville B-2	TVA	50-521	CH	II	GE	TVA	07/07/80					Closed(1)
Hatch 1	GP	50-321	OL	II	GE	SS/Bech.	07/07/80 08/05/80	Yes	III-S68	Yes	RT,ST	Open
Hatch 2	GP	50-366	OL	II	GE	Bechtel	11/03/80 08/10/81	Yes	III-S71	Yes	RT,UT	Open
Hope Creek 1	PSE&G	50-354	CP	I	GE	Bechtel	07/02/80	Yes	III-W74	No	RT	Closed(3)
Hope Creek 2	PSE&G	50-355	CP	I	GE	Bechtel	07/02/80					Closed(1)
Humboldt Bay 3	PG&E	50-133	SDI	V	GE	Bechtel	06/26/80					Closed(1)
Indian Point 2	ConEd	50-247	OL	I	W	UE&C	07/07/80	No				Closed(2)
Indian Point 3	PASNY	50-286	OL	I	W	UE&C	06/27/80	No				Closed(2)
Jamesport 1	LILCO	50-516	CP	I	W	S&W	07/01/80					Closed(1)
Jamesport 2	LILCO	50-517	CP	I	W	S&W	07/01/80					Closed(1)
Kewaunee	WPS	50-305	OL	III	W	FPS	07/07/80	Yes	III-68	No	RT	Closed(3)
LaCrosse	DP	50-409	OL	III	Allis	S&L	06/13/80	Yes	VIII-62	No	Leak	Closed(5)
LaSalle 1	CECO	50-373	OL	III	GE	S&L	07/09/80 08/15/80	Yes	III-74	No	RT	Closed(3)
LaSalle 2	CECO	50-374	CP	III	GE	S&L	07/09/80 08/15/80	Yes	III-74	No	RT	Closed(3)
Limerick 1	PECO	50-352	CP	I	GE	Bechtel	07/02/80	Yes	III-W74	No	RT	Closed(3)
Limerick 2	PECO	50-353	CP	I	GE	Bechtel	07/02/80	Yes	III-W74	No	RT	Closed(3)
Maine Yankee	MYAPCO	50-309	OL	I	C-E	S&W	07/01/80	Yes	III-68	Yes	ST	Closed(5)
Marble Hill 1	PSI	50-546	CP	III	W	S&L	07/03/80	Yes	III-W77	No	RT,UT	Closed(3)
Marble Hill 2	PSI	50-547	CP	III	W	S&L	07/03/80	Yes	III-W77	No	RT,UT	Closed(3)
McGuire 1	DUPCO	50-369	OL	II	W	DUPCO	07/07/80	Yes	III-S71	No	RT, UT	Closed(3)
McGuire 2	DUPCO	50-370	OL	II	W	DUPCO	07/07/80	Yes	III-S71	No	RT,UT	Closed(3)

See footnotes at end of table.

Facility	Utility	Docket No.	Fac. St.[a]	NRC Req.	NSSS Supp.	Arch. Engr.	Response Date	Butt Weld[b]	ASME Code[c]	Bkg. Bar	NDE[d]	Bulletin Status[e]
Midland 1	CP	50-329	CP	III	B&W	Bechtel	07/11/80 08/14/80	Yes	III-S73	No	RT	Closed(3)
Midland 2	CP	50-330	CP	III	B&W	Bechtel	07/11/80 08/14/80	Yes	III-S73	No	RT	Closed(3)
Millstone 1	NU	50-245	OL	I	GE	Ebasco	06/19/80	Yes	III-65	Yes	RT	Closed(3)
Millstone 2	NU	50-336	OL	I	C-E	Bechtel	06/19/80	Yes	III-71	Yes	RT	Closed(3)
Millstone 3	NU	50-423	CP	I	W	S&W	07/08/80	Yes	III-S73	Yes	RT	Closed(4)[g]
Monticello	NSP	50-263	OL	III	GE	Bechtel	07/03/80	Yes	III-S66	No	RT,UT,ST	Open[h]
Nine Mile Point 1	NMP	50-220	OL	I	GE	NMP	06/09/80	Yes	III-65	No	RT	Closed(3)
Nine Mile Point 2	NMP	50-410	CP	I	GE	S&W	07/10/80	Yes		Yes	RT	Closed(4)[i]
North Anna 1	VEPCO	50-338	OL	II	W	S&W	07/07/80	Yes	III-S69	Yes	ST	Closed(5)
North Anna 2	VEPCO	50-339	OL	II	W	S&W	07/07/80	Yes	III-S69	Yes	ST	Closed(5)
North Anna 3	VEPCO	50-404	CD	II	B&W	S&W	05/28/80					Closed(1)
North Anna 4	VEPCO	50-405	CD	II	B&W	S&W	05/28/80					Closed(1)
Oconee 1	DUPCO	50-269	OL	II	B&W	Bechtel	07/01/80	Yes	III-W66	Yes	RT	Closed(3)
Oconee 2	DUPCO	50-270	OL	II	B&W	and	07/01/80	Yes	III-W66	Yes	RT	Closed(3)
Oconee 3	DUPCO	50-287	OL	II	B&W	DUPCO	07/01/80	Yes	III-W66	Yes	RT	Closed(3)
Oyster Creek 1	JCP&L	50-219	OL	I	GE	B&R	07/07/80	Yes	III-S67	No	RT,ST	Open
Palisades	CP	50-255	OL	III	C-E	Bechtel	07/09/80	Yes	III-68	Yes	ST	Closed(5)
Palo Verde 1	APSCO	50-528	CP	V	C-E	Bechtel	07/08/80	Yes	III-W75	Yes	RT	Closed(3)
Palo Verde 2	APSCO	50-529	CP	V	C-E	Bechtel	07/08/80	Yes	III-W75	Yes	RT	Closed(3)
Palo Verde 3	APSCO	50-530	CP	V	C-E	Bechtel	07/08/80	Yes	III-W75	Yes	RT	Closed(3)
Peach Bottom 2	PECO	50-277	OL	I	GE	Bechtel	06/30/80	Yes	31.1-67	No	RT,UT	Closed(3)
Peach Bottom 3	PECO	50-278	OL	I	GE	Bechtel	06/30/80	Yes	31.1-67	No	RT,UT	Closed(3)
Perkins 1	DUPCO	50-488	CD	II	C-E	DUPCO	07/07/80					Closed(1)
Perkins 2	DUPCO	50-489	CD	II	C-E	DUPCO	07/07/80					Closed(1)
Perkins 3	DUPCO	50-490	CD	II	C-E	DUPCO	07/07/80					Closed(1)
Perry 1	CEI	50-440	CP	III	GE	Gilbert	07/10/80	Yes	III-W75	No	RT,UT	Closed(3)
Perry 2	CEI	50-441	CP	III	GE	Gilbert	07/10/80	Yes	III-W75	No	RT,UT	Closed(3)
Phipps Bend 1	TVA	50-553	CH	II	GE	TVA	07/07/80					Closed(1)
Phipps Bend 2	TVA	50-554	CH	II	GE	TVA	07/07/80					Closed(1)
Pilgrim 1	BECO	50-293	OL	I	GE	Bechtel	05/16/80	Yes	III-68	Yes	ST	Closed(5)
Point Beach 1	WEPCO	50-266	OL	III	W	Bechtel	07/03/80	Yes	III-S68	Yes	RT,ST	Closed(5)
Point Beach 2	WEPCO	50-301	OL	III	W	Bechtel	07/03/80	Yes	III-S68	Yes	ST	Closed(5)

See footnotes at end of table.

Facility	Utility	Docket No.	Fac. St.[a]	NRC Reg.	NSSS Supp.	Arch. Engr.	Response Date	Butt Weld[b]	ASME Code[c]	Bkg. Bar	NDE[d]	Bulletin Status[e]
Prairie Island 1	NSP	50-282	OL	III	W	FPS	07/10/80 07/22/80	Yes	31.3-67	Yes	RT,UT	Open
Prairie Island 2	NSP	50-306	OL	III	W	FPS	08/21/80 10/31/80	Yes	31.1-67	Yes	RT	Closed(3)
Quad Cities 1	CECO	50-254	OL	III	GE	S&L	07/09/80 08/15/80	Yes	III-W65	Yes	RT	Closed(3)
Quad Cities 2	CECO	50-265	OL	III	GE	S&L	07/09/80 08/15/80	Yes	III-W65	Yes	RT	Closed(3)
Rancho Seco 1	SMUD	50-312	OL	V	B&W	Bechtel	07/07/80 12/05/80	Yes	31.7-69	No	RT	Closed(3)
River Bend 1	GSU	50-458	CP	IV	GE	S&W	07/07/80	Yes	III-74	Yes	RT	Closed(3)
River Bend 2	GSU	50-459	CH	IV	GE	S&W	07/07/80					Closed(1)
Robinson 2	CP&L	50-261	OL	II	W	Ebasco	07/03/80	No			ST	Closed(2)[j]
Salem 1	PSE&G	50-272	OL	I	W	PSE&G	06/30/80	Yes	VIII-71	Yes	RT,ST	Open
Salem 2	PSE&G	50-311	OL	I	W	PSE&G	06/30/80	Yes	VIII-71	Yes	RT,ST	Open
San Onofre 1	SCE	50-206	OL	V	W	Bechtel	06/30/80	Yes	III-65	Yes	RT	Closed(3)
San Onofre 2	SCE	50-361	OL	V	C-E	Bechtel	07/01/80	Yes	III-S74	k	RT	Closed(3)
San Onofre 3	SCE	50-362	OL	V	C-E	Bechtel	07/01/80	Yes	III-S74	k	RT	Closed(3)
Seabrook 1	PSNH	50-443	CP	I	W	UE&C	06/25/80	Yes	III-W75	No	RT	Closed(3)
Seabrook 2	PSNH	50-444	CP	I	W	UE&C	06/25/80	Yes	III-W75	No	RT	Closed(3)
Sequoyah 1	TVA	50-327	OL	II	W	TVA	07/08/80	Yes	III-S69	No	RT	Closed(3)
Sequoyah 2	TVA	50-328	OL	II	W	TVA	07/08/80	Yes	III-S69	No	RT	Closed(3)
Shoreham	LILCO	50-322	CP	I	GE	S&W	07/10/80 03/16/83	Yes	III-S69	Yes	ST	Closed(5)
South Texas 1	HL&P	50-498	CP	IV	W	Brown	07/03/80 08/04/80	Yes	III-77	No	RT	Closed(3)
South Texas 2	HL&P	50-499	CP	IV	W	Brown	07/03/80 08/04/80	Yes	III-77	No	RT	Closed(3)
St. Lucie 1	FPL	50-335	OL	II	C-E	Ebasco	07/08/80	Yes	III-W69	Yes	RT,UT	Open
St. Lucie 2	FPL	50-389	OL	II	C-E	Ebasco	07/07/80 09/29/80 12/01/80	Yes	III-W73	No	RT	Closed(3)
Sterling	RG&E	50-485	CD	I	W	Bechtel						Closed(1)
Summer 1	SCE&G	50-395	OL	II	W	Gilbert	06/24/80	Yes	III-W75	No	RT	Closed(3)
Surry 1	VEPCO	50-280	OL	II	W	S&W	07/07/80	Yes	III-68	Yes	ST	Closed(5)
Surry 2	VEPCO	50-281	OL	II	W	S&W	07/07/80	Yes	III-68	Yes	ST	Closed(5)

See footnotes at end of table.

Facility	Utility	Docket No.	Fac. St.[a]	NRC Req.	NSSS Supp.	Arch. Engr.	Response Date	Butt Weld[b]	ASME Code[c]	Bkg. Bar	NDE[d]	Bulletin Status[e]
Susquehanna 1	PP&L	50-387	OL	I	GE	Bechtel	08/07/80	Yes	III-W72	No	RT,UT	Closed(3)
Susquehanna 2	PP&L	50-388	CP	I	GE	Bechtel	08/07/80	Yes	III-W72	No	RT,UT	Closed(3)
TMI 1	Met-Ed	50-289	OL	I	B&W	Gilbert	07/18/80	No				Closed(2)
TMI 2	Met-Ed	50-320	SDI	I	B&W	B&R						Closed(1)
Trojan	PGE	50-344	OL	V	W	Bechtel	07/02/80 08/14/80 08/25/80 06/29/81	Yes	III-W71	Yes	RT	Closed(3)
Turkey Point 3	FPL	50-250	OL	II	W	Bechtel	07/09/80 12/30/80	Yes	III-566	Yes	RT	Open
Turkey Point 4	FPL	50-251	OL	II	W	Bechtel	09/15/81	Yes	III-566	Yes	RT	Closed(3)
Vermont Yankee 1	VYNP	50-271	OL	I	GE	Ebasco	07/07/80	Yes	III-68	Yes	RT	Closed(5)
Vogtle 1	GP	50-424	CP	II	W	SS/Bech.	06/26/80	Yes	III-S78	Yes	RT	Closed(3)
Vogtle 2	GP	50-425	CP	II	W	SS/Bech.	06/26/80	Yes	III-S78	Yes	RT	Closed(3)
WNP 1	WPPSS	50-460	CP	V	B&W	UE&C	07/10/80	Yes	III-S77	No	RT	Closed(3)
WNP 2	WPPSS	50-397	CP	V	GE	B&R	07/10/80	Yes	III-S72	Yes	RT	Closed(3)
WNP 3	WPPSS	50-508	CP	V	C-E	Ebasco	07/15/80	Yes	III-S78	No	RT,UT	Closed(3)
WNP 4	WPPSS	50-513	CD	V	B&W	UE&C	07/10/80					Closed(1)
WNP 5	WPPSS	50-509	CD	V	C-E	Ebasco	07/15/80					Closed(1)
Waterford 3	LP&L	50-382	CP	IV	C-E	Ebasco	07/03/80	Yes	III-W73	No	RT	Closed(3)
Watts Bar 1	TVA	50-390	CP	II	W	TVA	07/08/80	Yes	III-W73	No	RT	Closed(3)
Watts Bar 2	TVA	50-391	CP	II	W	TVA	07/08/80	Yes	III-W73	No	RT	Closed(3)
Wolf Creek 1	KG&E	50-482	CP	IV	W	S&L	07/01/80	Yes	III-S75	No	RT	Closed(3)
Yankee-Rowe 1	YAECO	50-29	OL	I	W	S&W	06/25/80	No	VIII-56	1		Closed(2)
Yellow Creek 1	TVA	50-566	CH	II	C-E	TVA	07/08/80					Closed(1)
Yellow Creek 2	TVA	50-567	CH	II	C-E	TVA	07/08/80					Closed(1)
Zimmer 1	CG&E	50-358	CP	III	GE	S&L	07/07/80	Yes	III-W73	Yes	RT,UT	Closed(3)
Zion 1	CECO	50-295	OL	III	W	S&L	07/09/80 08/15/80	Yes	III-68	Yes	RT	Closed(3)
Zion 2	CECO	50-304	OL	III	W	S&L	07/09/80 08/15/80	Yes	III-68	Yes	RT	Closed(3)

See footnotes on next page.

[a] Facility Status: OL, Operating License; CP, Construction Permit; CD, Cancelled; SDI, Shut Down Indefinitely; LPT, Low Power Testing License; CH, Construction Halted Indefinitely.

[b] Butt weld between containment penetration sleeve and process piping similar to one of those illustrated in Figure NE-1120-1(c) of ASME Nuclear Code, Section III, Winter 1975 Addenda, and later editions(Page A-3).

[c] ASME Boiler and Pressure Vessel Codes, or Piping Codes: Section (III, VIII, B31.1, B31.7) and Year or Addenda and Year (S = Summer, W = Winter), governing penetration design and/or fabrication.

[d] Non-destructive Examination of butt weld: RT = radiographic, UT = ultrasonic, ST = surface examination, either magnetic particle (MT) or liquid penetrant (PT).

[e] Bulletin Status: Number in parentheses refers to closeout criteria used, Page 2 . For facilities with open status, see followup items in Appendix C.

[f] Beaver Valley 2. RT performed on all 19 flued head butt welds. Results verified in Inspection Report 50-412/82-07(7/12/82).

[g] Millstone 3. Reinspection by RT and repairs performed on all butt welds. Results verified in Inspection Reports 50-423/81-14(1/6/81) and 50-423/82-02(2/26/82).

[h] Monticello. Triple flued head design used, which accommodates expansion bellows. Liquid penetrant or magnetic particle examination used on root pass and final surface of expansion bellows-to-flued head weld. All other butt joints examined by radiography or ultrasonics, no backing bars used.

[i] Nine Mile Point 2. Re-examination of all penetration butt joint welds made using RT. and necessary r pairs made. Results verified in Inspection Reports 50-410/80-02(5/9/80) and 50-410/81-06(8/19/81).

[j] Robinson 2. Inspection Report 50-261/81-09(4/1/81) verifies that penetration weld design is not of concern.

[k] Harris 1,2; San Onofre 2,3. Use of backing bar cannot be determined from licensee response.

[l] Fort St. Vrain; Yankee Rowe 1. Use of backing bar could not be determined by licensee.

APPENDIX C

Proposed Followup Items

APPENDIX C

Proposed Followup Items

Region I

Oyster Creek 1. Welds FW5558 and FW5575A on isolation condenser penetrations were surfaced examined, but were not volumetrically examined. Radiograph records could not be located for weld SW NP2-B of the liquid poison system penetration and welds S1364 and S1367 of the reactor feedwater system penetrations. A later response was promised. Followup to determine the resolution of these items is proposed.

Salem 1, 2. The butt weld of penetration No. 18 in each unit could not be reexamined by radiography because each penetration contains five pipes and cooling coil, and has external cooling fins adjacent to the weld. Magnetic particle examination (MT) was performed as an alternative, confirmed by Inspection Report 50-272/80-23, 50-311/80-18, dated 12/3/80.

Additional information needed to evaluate the acceptability of the surface examinations in lieu of radiographic examinations would be provided by answers to the following questions:

1. What are the functions of the five pipes contained in the penetration? Are they high energy lines?

2. Are there butt welds in the piping within the penetrations such that inservice inspection of these pipe welds is not possible?

Region II

Brunswick 1, 2. This facility contains 18 penetrations of the flued head design of concern. Radiographic examination was performed on all 18 root welds of the sleeve-to-flued fitting butt weld, and on 12 of the 18 final welds. Six of the 18 final welds were examined with ultrasonics. All 18 welds have backing bars, so the Bulletin cannot be closed on the basis of Criterion 4. Followup per Recommendation No. 2, Page 5, is proposed.

Hatch 1. Of 18 penetrations of the flued head design of concern, four were examined radiographically, and the remainder were examined using liquid penetrant. Backing rings were used for most.

A review of the penetration butt weld designs should be made to determine if they fit the remaining concern design description (Page 3). Justifications given in the facility response of 8/10/81 are based on the conclusion that radiographic examination is impractical, with no argument that the weld quality is judged to be adequate. More suitable justifications based on weld design and quality, following Recommendations 1.3 and 1.4, Page 5, are suggested.

Hatch 2. Of 18 penetrations of the flued head design of concern, 15 welds with backing bars were examined using ultrasonics. Four of these 15 were examined radiographically during shutdown; no rejectable indications were found. Radiography is judged impractical on the remainder. Followup per Recommendation No. 2, Page 5, is proposed.

St. Lucie 1. Ultrasonic testing was used to examine the sleeve-to-flued head welds on three penetrations where a final repair employed a partial backing ring. Two of the three were radiographed later during shutdown, and were found acceptable. The one penetration, No. P-33, which was inaccessible for radiography of this weld, is a containment sump suction penetration. Followup per Recommendation No. 2, Page 5, is proposed.

Turkey Point 3. Records of the original examination by radiography of one penetration butt weld (Penetration No. 32) could not be located. This weld was reexamined and repairs to the weld were found to be required. Inspection verification of the examination and repairs is suggested to close the Bulletin.

Region III

Monticello. This facility contains many penetrations of the triple flued head type, where all containment boundary butt welds except the expansion bellows to flued head joint are volumetrically examined. No backing bars are used. The bellows to flued head welds were surface examined, root passes and final surfaces, because radiography was impractical. Followup per Recommendations 1.1, 1.3 and 1.4 (Pages 4 and 5) is proposed.

Prairie Island 1. Two butt welds between penetration sleeve and flued head have backing rings and were examined using ultrasonics. An attempt to radiograph these welds during shutdown was unsuccessful because of the 7-1/2 inch steel thickness. Documentation of the ultrasonic examination shows that the test personnel were aware the backing rings were present. Followup per Recommendation No. 2, Page 5, is proposed.

APPENDIX D

Abbreviations

APPENDIX D

Abbreviations

Utilities

APCO	Alabama Power Company
AP&L	Arkansas Power and Light Company
APSCO	Arizona Public Service Company
BECO	Boston Edison Company
BG&E	Baltimore Gas and Electric Company
CECO	Commonwealth Edison Company
CEI	Cleveland Electric Illuminating Company
CG&E	Cincinnati Gas and Electric Company
ConEd	Consolidated Edison Company of New York, Inc.
CP	Consumers Power Company
CP&L	Carolina Power and Light Company
CYAPCO	Connecticut Yankee Atomic Power Company
DECO	Detroit Edison Company
DL	Duquesne Light Company
DP	Dairyland Power Cooperative
DUPCO	Duke Power Company
FP	Florida Power Company
FPL	Florida Power and Light Company
GP	Georgia Power Company
GSU	Gulf States Utilities Company
HL&P	Houston Lighting and Power Company
IELPCO	Iowa Electric Light and Power Company
IMECO	Indiana & Michigan Electric Company
IP	Illinois Power Company
JCP&L	Jersey Central Power and Light Company
KG&E	Kansas Gas and Electric Company
LILCO	Long Island Lighting Company
LP&L	Louisiana Power and Light Company
Met-Ed	Metropolitan Edison Company
MP&L	Mississippi Power and Light Company
MYAPCO	Maine Yankee Atomic Power Company
NIPSCO	Northern Indiana Public Service Company
NMP	Niagara Mohawk Power Corporation
NPPD	Nebraska Public Power District
NSP	Northern Sates Power Company
NU	Northeast Nuclear Energy Company, Northeast Utilities
OPPD	Omaha Public Power District
PASNY	Power Authority of the State of New York

Utilities (contd.)

PECO	Philadelphia Electric Company
PGE	Portland General Electric Company
PG&E	Pacific Gas and Electric Company
PP&L	Pennsylvania Power and Light Company
PSCC	Public Service Company of Colorado
PSCO	Public Service Company of Oklahoma
PSE&G	Public Service Electric and Gas Company
PSI	Public Service Indiana
PSNH	Public Service Company of New Hampshire
RG&E	Rochester Gas and Electric Corporation
SCE	Southern California Edison Company
SCE&G	South Carolina Electric & Gas Company
SMUD	Sacramento Municipal Utility District
TECO	Toledo Edison Company
TUGCO	Texas Utilities Generating Company
TVA	Tennessee Valley Authority
UE	Union Electric Company
VEPCO	Virginia Electric and Power Company
VYNP	Vermont Yankee Nuclear Power Corporation
WEPCO	Wisconsin Electric Power Company
WPPSS	Washington Public Power Supply System
WPS	Wisconsin Public Service Corporation
YAECO	Yankee Atomic Electric Company

Architect/Engineers, NSSS Suppliers

AEPSCO	American Electric Power Services Corporation
Allis	Allis-Chalmers Corporation
Bech.	Bechtel Corporation
B&R	Burns and Roe Incorporated
B&V	Black and Veatch Consulting Engineers
B&W	Babcock and Wilcox Company
C-E	Combustion Engineering Incorporated
FPS	Fluor Power Services
GA	General Atomic Company
GE	General Electric Company
G&H	Gibbs and Hill Incorporated
S&L	Sargent and Lundy Engineers
SS	Southern Services Incorporated
S&W	Stone and Webster Engineering Corporation
UE&C	United Engineers and Constuctors
W	Westinghouse Electric Corporation

Miscellaneous

ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
B&PV	Boiler and Pressure Vessel
BWR	Boiling Water Reactor
CD	Cancelled
CFR	Code of Federal Regulations
CH	Construction Halted Indefinitely
CL	Closed
CP	Construction Permit
ECCS	Emergency Core Cooling System
EPRI	Electric Power Research Institute
HTGR	High Temperature Gas Cooled Reactor
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LPT	Low Power Testing License
NDE	Nondestructive Examination
NRC/IE	Nuclear Regulatory Commission/ Office of Inspection and Enforcement
NSSS	Nuclear Steam Supply System
OL	Operating License
OP	Open
PWR	Pressurized Water Reactor
RT	Radiographic Examination
SDI	Shut Down Indefinitely
SNUPPS	Standardized Nuclear Power Plant System
TMI	Three Mile Island
UT	Ultrasonic Examination

NRC FORM 335 (11-81)

U.S. NUCLEAR REGULATORY COMMISSION

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7. AUTHOR(S)
R. S. Dean, W. J. Foley, A. Hennick

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16. ABSTRACT (200 words or less)

During an NRC inspection at Nine Mile Point 2, examination by radiography of primary containment liner penetration sleeve-to-process pipe (flued head fitting) welds revealed rejectable defects not originally found by ultrasonic examination. Apparently, ultrasonic signals from the weld backing bar masked signals from defects. Further investigation found similar problems at Beaver Valley 2 and North Anna 3 and 4. IE Bulletin 80-08 was issued to acquire information from all facilities to determine the generic nature of the problem. It was found that, because of evolution of the ASME Nuclear Code, plants under construction designed to that Code since about 1974 are required to volumetrically examine these welds, and so, in general, do not have the problem. Operating plants, built to earlier codes not requiring such design and examination for the containment welds, present a concern for the quality of this type of weld and for the integrity of the primary containment boundary. Bulletin status is closed for all but 11 facilities. Recommendations are made for resolution of the problem for these facilities. These include meaningful radiographic examination of welds of concern, if possible, and if not, licensee justification for not making a radiographic examination.

17. KEY WORDS AND DOCUMENT ANALYSIS

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NRC FORM 335 (11-81)

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NUREG/CR-3053

CLOSEOUT OF IE BULLETIN 80-08: EXAMINATION OF CONTAINMENT LINER PENETRATION WELDS

JULY 1984