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# Closeout of IE Bulletin 79-03: Longitudinal Weld Defects in ASME SA-312 Type 304 Stainless Steel Pipe Spools Manufactured by Youngstown Welding and Engineering Co.

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Prepared by W. J. Foley, R. S. Dean, A. Hennick

PARAMETER, Inc.

Prepared for  
U.S. Nuclear Regulatory  
Commission

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# Closeout of IE Bulletin 79-03: Longitudinal Weld Defects in ASME SA-312 Type 304 Stainless Steel Pipe Spools Manufactured by Youngstown Welding and Engineering Co.

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## ABSTRACT

Documentation is provided in this report for the closeout of IE Bulletin 79-03, on the subject of fusion welded austenitic stainless steel pipe (without filler metal) manufactured by the Youngstown Welding and Engineering Company. Only pipe used or planned for use in safety-related systems is considered. The bulletin is closed out on the basis of definite criteria for all of the 121 facilities for which actions were required. This bulletin was issued by the NRC on March 12, 1979 to require certain actions by all holders of operating licenses and construction permits for power reactors. The NRC's concern was based on the discoveries of faulty longitudinal welds at Palo Verde and San Onofre. The investigations for Bulletin 79-03 led to the finding that volumetric examination of the fusion welds per the ASME Code requirements did not assure detection of centerline lack of penetration (CLP). Therefore, the problem of faulty welds applied to all manufacturers of SA-312/A-312 Type 300 Series welded steel pipe. Bulletin 79-03A was issued on April 4, 1980 to supersede the required actions of Bulletin 79-03, and to collect information on all of the subject pipe and fittings in safety-related systems. Refer to NUREG/CR-5284 for the companion closeout report on IE Bulletin 79-03A, "Longitudinal Weld Defects in ASME SA-312 Type 304 Stainless Steel Pipe". Background information is provided in the Introduction and Appendix A of this report as well as NUREG/CR-5284.



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CLOSEOUT OF IE BULLETIN 79-03:  
LONGITUDINAL WELD DEFECTS IN ASME SA-312 TYPE 304  
STAINLESS STEEL PIPE SPOOLS MANUFACTURED BY  
YOUNGSTOWN WELDING AND ENGINEERING COMPANY

## INTRODUCTION

This report provides documentation for the closeout status of IE Bulletin 79-03 in accordance with the Statement of Work in Task Order 37 under NRC Contract 05-85-157-02. The documentation is based on the records obtained from the NRC Document Control System.

IE Bulletin 79-03 was issued on March 12, 1979 to determine the generic extent of defects in the longitudinal welds (without filler metal) of ASME Section III Class 2 austenitic stainless steel pipe. The pipe was manufactured by the Youngstown Welding and Engineering Company and supplied to nuclear plants for use in safety-related systems. A description of the circumstances leading up to the issuance of the bulletin is included in Appendix A of this report, starting on Page A-1.

The bulletin required licensees and holders of construction permits to determine if their power plants contained any of the subject piping in safety-related systems, to identify the applications, to develop a program for volumetric examination of the longitudinal welds in the piping, to plan corrective actions if acceptance criteria were not met, and to report findings in writing to the NRC. These required actions are presented for reference in Appendix A of this report, starting on Page A-2.

The required actions of Bulletin 79-03 were superseded in April of 1980 by the actions required by followup Bulletin 79-03A. Results of investigations required for the earlier bulletin showed that conventional volumetric examination techniques for piping were not adequate to detect centerline lack of weld penetration (CLP). The problem was considered generic to all fusion welded SA-312/A-312 Type 300 Series material. As a result, some facilities are closed out for Bulletin 79-03 on the basis of closeout of Bulletin 79-03A. The closeout report for Bulletin 79-03A is NUREG/CR-5284.

Evaluation of utility responses and NRC/Region inspection reports is documented in Appendix B as the basis for bulletin closeout. Abbreviations used in this report and associated documents are listed in Appendix C.

## SUMMARY

1. The bulletin has been closed for the following 23 facilities because the required actions for Bulletin 79-03 have been completed satisfactorily, and have been verified in an NRC/Region inspection report (Criterion 1, see Page B-9):

|                    |                    |                  |
|--------------------|--------------------|------------------|
| Calvert Cliffs 1,2 | Palo Verde 1,2,3   | Susquehanna 1,2  |
| Comanche Peak 1,2  | Prairie Island 1,2 | TMI 1            |
| Limerick 1,2       | San Onofre 2,3     | Turkey Point 3,4 |
| Millstone 2        | Seabrook 1,2       | Wolf Creek 1     |
| Nine Mile Point 2  |                    |                  |

2. The bulletin has been closed for the following 74 facilities which did not have the subject piping in use or planned for use in safety-related systems (Criterion 2, see Page B-9):

|                    |                   |                  |
|--------------------|-------------------|------------------|
| Beaver Valley 1,2  | Ginna             | Perry 1,2        |
| Bellefonte 1,2     | Grand Gulf 1      | Pilgrim 1        |
| Big Rock Point 1   | Haddam Neck       | Point Beach 1,2  |
| Braidwood 1,2      | Harris 1          | Quad Cities 1,2  |
| Browns Ferry 1,2,3 | Hope Creek 1      | Rancho Seco 1    |
| Brunswick 1,2      | Indian Point 2,3  | River Bend 1     |
| Byron 1,2          | Kewaunee          | Salem 1,2        |
| Clinton 1          | LaSalle 1,2       | San Onofre 1     |
| Cook 1,2           | Maine Yankee      | Sequoyah 1,2     |
| Cooper Station     | Millstone 1       | St. Lucie 1,2    |
| Diablo Canyon 1,2  | Monticello        | Summer 1         |
| Dresden 2,3        | Nine Mile Point 1 | Trojan           |
| Duane Arnold       | North Anna 1      | Vermont Yankee 1 |
| Farley 1,2         | Oconee 1,2,3      | Waterford 3      |
| FitzPatrick        | Oyster Creek 1    | WNP 2            |
| Fort Calhoun 1     | Palisades         | Yankee-Rowe 1    |
| Fort St. Vrain     | Peach Bottom 2,3  | Zion 1,2         |

3. The bulletin has been closed on the basis of closeout of superseding Bulletin 79-03A for the following 24 facilities (Criterion 3, see Page B-9):

|                 |              |                 |
|-----------------|--------------|-----------------|
| Arkansas 1,2    | Hatch 1,2    | Shoreham        |
| Callaway 1      | McGuire 1,2  | South Texas 1,2 |
| Catawba 1,2     | Millstone 3  | Surry 1,2       |
| Crystal River 3 | North Anna 2 | Vogtle 1,2      |
| Davis-Besse 1   | Robinson 2   | Watts Bar 1,2   |
| Fermi 2         |              |                 |

4. The following seven (7) facilities are excluded from Table B.1, because they are shut down indefinitely or permanently or have construction halted indefinitely:

|                |                |         |
|----------------|----------------|---------|
| Dresden 1      | Indian Point 1 | TMI 2   |
| Humboldt Bay 3 | La Crosse      | WNP 1,3 |

## CONCLUSION

Findings subsequent to the issuance of Bulletin 79-03 regarding volumetric examination of pipe spools indicated the need for additional information and clarification to resolve the SA-312 issue. Bulletin 79-03A was issued to accomplish this need (see NUREG/5284).

## **APPENDIX A**

### **Background Information and Required Actions**

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

IE Bulletin No. 79-03  
Date: March 12, 1979  
Page 1 of 3

**LONGITUDINAL WELD DEFECTS IN ASME SA-312 TYPE 304 STAINLESS STEEL  
PIPE SPOOLS MANUFACTURED BY YOUNGSTOWN WELDING AND ENGINEERING COMPANY**

**Description of Circumstances:**

On September 27, 1978, the Arizona Public Service Company reported that defects had been discovered in longitudinal welds in ASME Section III class 2 pipe supplied for the Palo Verde Nuclear Generating Station (PVNGS). On November 17, 1978, the Southern California Edison Company reported similar defects in pipe supplied for the San Onofre Nuclear Generating Station, Units 2 and 3.

Pullman Power Products of Los Angeles, California supplies safety-related fabricated piping spools of various diameters for the PVNGS. The defects were discovered by Pullman in ASME SA-312 type 304 stainless steel pipe supplied to Pullman by Youngstown Welding and Engineering Company of Youngstown, Ohio. The pipe is manufactured by rolling plate into cylinders and then fusion welding the longitudinal seam without filler metal.

Pullman discovered defects in the longitudinal welds while radiographing their circumferential shop welds. Further radiographic examination of the longitudinal welds revealed rejectable porosity and lack of fusion.

Pullman then performed ultrasonic examination of the full length of the longitudinal welds and discovered indications exceeding the acceptance criteria of ASME Section III. Further ultrasonic examination revealed indications in other piping subassemblies where pipe was supplied by Youngstown. Two indications verified by radiography were identified as porosity and measured 0.350 inch by 0.125 inch in one case and 0.300 inch by 0.125 inch in another case in pipe with a nominal wall thickness of 0.375 inch.

The additional examinations revealed that of 103 spools and four pipe supports shipped to PVNGS, 44 spools and one pipe support were found to contain ultrasonic indications exceeding those permitted by the ASME Code. Of 65 partially fabricated piping spools, 30 were found to be similarly defective. The acceptance criteria for the pipe supplied by Youngstown includes 100 percent ultrasonic examination of the longitudinal

welds in accordance with ASME Section III. The documentation provided with the pipe indicated that the required ultrasonic examination had been performed by Youngstown but the rejectable indications were not identified.

A special inspection was performed at Youngstown by NRC inspectors during the week of January 22, 1979. It was determined that the apparent cause of the identified defects was inadequate control of welding parameters although no specific ASME Code violations could be identified. Youngstown has recently hired a consultant to reevaluate the fusion welding parameters and revised their welding procedures to provide better control of welding current, voltage and travel speed for all material thickness ranges.

Ultrasonic examinations of the pipe welds were performed by a subcontractor to Youngstown. The reason why this subcontractor's ultrasonic testing did not detect indications exceeding ASME Code acceptance criteria was not determined. The piping was known to have been tested in the heat treated condition, prior to the removal of surface oxides. However, a comparison of attenuation of the pipe in as heat treated vs. heat treated and pickled condition did not reveal a discernible difference.

The NRC inspectors could not determine a definite time period during which the welding and ultrasonic testing problems are thought to have existed. All type 304 or 316 SA 312 pipe manufactured before mid-November, 1978 may have been shipped in similar condition. As a large supplier, Youngstown is known to have supplied piping for nuclear applications to the Dravo Corporation, Chicago Bridge and Iron, Flowline Corporation and ITT Grinnell Industrial Piping Inc. In addition, piping was also supplied to material warehousing operations including Albert Pipe Supply, Guyon Alloys Inc., and Allegheny Ludlum Steel Corporation which may have eventually been used in safety-related nuclear applications.

**Action to be Taken by the Licensees and Permit Holders:**

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

1. Determine whether ASME SA-312, type 304 or other welded (without filler metal) pipe manufactured by Youngstown Welding and Engineering Company is in use or planned for use in safety-related systems at your facility.

2. For those safety-related systems where the subject piping is in use or planned for use, identify the application of the piping including system, pipe location, pipe size and design pressure/temperature requirements.
3. Develop a program for volumetric examination of the longitudinal welds including acceptance criteria for the piping identified in Item 2 above. Describe planned corrective actions if acceptance criteria are not met. If a sampling program is utilized explain the basis for the sample size.
4. For facilities with an operating license, a report of the above actions, including the date(s) when they will be completed shall be submitted within 30 days of receipt of this Bulletin.
5. For facilities with a construction permit, a report of the above actions, including the date(s) when they will be completed shall be submitted within 60 days of receipt of this bulletin.

Reports should be submitted to the Director of the appropriate NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, 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.

**APPENDIX B**

**Documentation of Bulletin Closeout**



TABLE B.1 BULLETIN CLOSEOUT STATUS

| Facility         | Utility | Docket | Facility Status |      | NRC Region | NSSS | A/E     | Utility Response Date                        | Inspection Report and Date | Closeout Status and Criterion |
|------------------|---------|--------|-----------------|------|------------|------|---------|--|----------------------------|-------------------------------|
|                  |         |        | 1988            | 1979 |            |      |         |  |                            |                               |
| Arkansas 1       | AP&L    | 50-313 | OL              | OL   | IV         | B&W  | Bechtel | 04-12-79<br>05-14-79<br>06-22-79<br>08-31-79 |                            | Closed 3                      |
| Arkansas 2       | AP&L    | 50-368 | OL              | OL   | IV         | C-E  | Bechtel | 04-12-79<br>05-14-79<br>06-22-79<br>08-31-79 |                            | Closed 3                      |
| Beaver Valley 1  | DLC     | 50-334 | OL              | OL   | I          | W    | S&W     | 04-11-79                                     | 82-06(04-07-82)            | Closed 2                      |
| Beaver Valley 2  | DLC     | 50-412 | OL              | CP   | I          | W    | S&W     | 05-17-79                                     |                            | Closed 2                      |
| Bellefonte 1     | TVA     | 50-438 | CP              | CP   | II         | B&W  | TVA     | 05-14-79<br>07-13-79<br>09-13-79<br>11-29-79 | 80-02(02-05-80)            | Closed 2                      |
| Bellefonte 2     | TVA     | 50-439 | CP              | CP   | II         | B&W  | TVA     | 05-14-79<br>07-13-79<br>09-13-79<br>11-29-79 | 80-02(02-05-80)            | Closed 2                      |
| Big Rock Point 1 | CPC     | 50-155 | OL              | OL   | III        | GE   | Bechtel | 04-16-79<br>05-30-79<br>07-30-79             | 80-17(11-25-80)            | Closed 2                      |
| Braidwood 1      | CECO    | 50-456 | OL              | CP   | III        | W    | S&L     | 05-08-79<br>08-10-79<br>09-05-79<br>09-20-79 | 81-13(12-01-81)            | Closed 2                      |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility         | Utility | Docket | Facility Status<br>1988 1979 |    | NRC<br>Region | NSSS | A/E     | Utility<br>Response<br>Date                  | Inspection<br>Report<br>and Date | Closure<br>Status and<br>Criterion |
|------------------|---------|--------|------------------------------|----|---------------|------|---------|--|----------------------------------|------------------------------------|
| Braidwood 2      | CECO    | 50-457 | OL                           | CP | III           | W    | S&L     | 05-08-79<br>08-10-79<br>09-05-79<br>09-20-79 | 81-13(12-01-81)                  | Closed 2                           |
| Browns Ferry 1   | TVA     | 50-259 | OL                           | OL | II            | GE   | TVA     | 04-12-79                                     |                                  | Closed 2                           |
| Browns Ferry 2   | TVA     | 50-260 | OL                           | OL | II            | GE   | TVA     | 04-12-79                                     |                                  | Closed 2                           |
| Browns Ferry 3   | TVA     | 50-296 | OL                           | OL | II            | GE   | TVA     | 04-12-79                                     |                                  | Closed 2                           |
| Brunswick 1      | CP&L    | 50-325 | OL                           | OL | II            | GE   | UE&C    | 04-12-79                                     |                                  | Closed 2                           |
| Brunswick 2      | CP&L    | 50-324 | OL                           | OL | II            | GE   | UE&C    | 04-12-79                                     |                                  | Closed 2                           |
| Byron 1          | CECO    | 50-454 | OL                           | CP | III           | W    | S&L     | 05-08-79<br>08-10-79<br>09-05-79<br>09-20-79 | 83-07(03-22-83)                  | Closed 2                           |
| Byron 2          | CECO    | 50-455 | OL                           | CP | III           | W    | S&L     | 05-08-79<br>08-10-79<br>09-05-79<br>09-20-79 | 83-03(03-22-83)                  | Closed 2                           |
| Callaway 1       | UE      | 50-483 | OL                           | CP | III           | W    | Bechtel | 05-11-79<br>10-05-79<br>08-20-80             |                                  | Closed 3                           |
| Calvert Cliffs 1 | BG&E    | 50-317 | OL                           | OL | I             | C-E  | Bechtel | 04-16-79<br>05-29-79                         | 83-13(07-13-83)                  | Closed 1                           |
| Calvert Cliffs 2 | BG&E    | 50-318 | OL                           | OL | I             | C-E  | Bechtel | 04-16-79<br>05-29-79                         | 83-13(07-13-83)                  | Closed 1                           |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility        | Utility | Docket | Facility Status |      | NRC Region | NSSS | A/E     | Utility Response Date            | Inspection Report and Date | Closeout Status and Criterion |
|-----------------|---------|--------|-----------------|------|------------|------|---------|----------------------------------|----------------------------|-------------------------------|
|                 |         |        | 1988            | 1979 |            |      |         |                                  |                            |                               |
| Catawba 1       | DUPCO   | 50-413 | OL              | CP   | II         | W    | DUPCO   | 04-20-79                         | 80-32(11-17-80)            | Closed 3                      |
| Catawba 2       | DUPCO   | 50-414 | OL              | CP   | II         | W    | DUPCO   | 04-20-79                         | 80-32(11-17-80)            | Closed 3                      |
| Clinton 1       | IP      | 50-461 | OL              | CP   | III        | GE   | S&L     | 08-20-79                         | 80-02(02-22-80)            | Closed 2                      |
| Comanche Peak 1 | TUGCO   | 50-445 | CP              | CP   | IV         | W    | G&H     | 05-07-79                         | 88-57(09-21-88)            | Closed 1                      |
| Comanche Peak 2 | TUGCO   | 50-446 | CP              | CP   | IV         | W    | G&H     | 05-07-79                         | 88-53(09-21-88)            | Closed 1                      |
| Cook 1          | IMECO   | 50-315 | OL              | OL   | III        | W    | AEPSO   | 04-17-79                         |                            | Closed 2                      |
| Cook 2          | IMECO   | 50-316 | OL              | OL   | III        | W    | AEPSO   | 04-17-79                         |                            | Closed 2                      |
| Cooper Station  | NPPD    | 50-298 | OL              | OL   | IV         | GE   | B&R     | 04-12-79                         | 79-12(08-06-79)            | Closed 2                      |
| Crystal River 3 | FPC     | 50-302 | OL              | OL   | II         | B&W  | Gilbert | 04-16-79<br>05-18-79             |                            | Closed 3                      |
| Davis-Besse 1   | TECO    | 50-346 | OL              | OL   | III        | B&W  | Bechtel | 04-16-79<br>05-16-79             |                            | Closed 3                      |
| Diablo Canyon 1 | PG&E    | 50-275 | OL              | CP   | V          | W    | PG&E    | 03-27-79                         |                            | Closed 2                      |
| Diablo Canyon 2 | PG&E    | 50-323 | OL              | CP   | V          | W    | PG&E    | 03-27-79                         |                            | Closed 2                      |
| Dresden 2       | CECO    | 50-237 | OL              | OL   | III        | GE   | S&L     | 04-12-79                         | 81-12(05-05-81)            | Closed 2                      |
| Dresden 3       | CECO    | 50-249 | OL              | OL   | III        | GE   | S&L     | 04-12-79                         |                            | Closed 2                      |
| Duane Arnold    | IELPCO  | 50-331 | OL              | OL   | III        | GE   | Bechtel | 04-16-79                         |                            | Closed 2                      |
| Farley 1        | APCO    | 50-348 | OL              | OL   | II         | W    | SS      | 04-11-79<br>04-26-79             | 79-26(07-25-79)            | Closed 2                      |
| Farley 2        | APCO    | 50-364 | OL              | CP   | II         | W    | SS      | 04-11-79<br>04-26-79             |                            | Closed 2                      |
| Fermi 2         | DECO    | 50-341 | OL              | CP   | III        | GE   | DECO    | 05-14-79<br>08-23-79<br>01-02-80 | 81-07(06-26-81)            | Closed 3                      |
| FitzPatrick     | PASNY   | 50-333 | OL              | OL   | I          | GE   | S&W     | 03-29-79                         | 79-06(06-13-79)            | Closed 2                      |
| Fort Calhoun 1  | OPPD    | 50-285 | OL              | OL   | IV         | C-E  | G&H     | 04-10-79                         |                            | Closed 2                      |
| Fort St. Vrain  | PSCC    | 50-267 | OL              | OL   | IV         | GA   | S&L     | 04-06-79                         | 79-12(06-28-79)            | Closed 2                      |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility       | Utility | Docket | Facility Status |      | NRC Region | NSSS | A/E     | Utility Response Date            | Inspection Report and Date | Closeout Status and Criterion |
|----------------|---------|--------|-----------------|------|------------|------|---------|----------------------------------|----------------------------|-------------------------------|
|                |         |        | 1988            | 1979 |            |      |         |                                  |                            |                               |
| Ginna          | RG&E    | 50-244 | OL              | OL   | I          | W    | Gilbert | 04-06-79                         | 85-12(08-23-85)            | Closed 2                      |
| Grand Gulf 1   | MP&L    | 50-416 | OL              | CP   | II         | GE   | Bechtel | 05-16-79                         | 79-13(07-13-79)            | Closed 2                      |
| Haddam Neck    | CYAPCO  | 50-213 | OL              | OL   | I          | W    | S&W     | 04-16-79                         | 85-01(03-07-85)            | Closed 2                      |
| Harris 1       | CP&L    | 50-400 | OL              | CP   | II         | W    | Ebasco  | 05-17-79                         | 79-10(07-10-79)            | Closed 2                      |
| Hatch 1        | GPC     | 50-321 | OL              | OL   | II         | GE   | Bechtel | 04-16-79<br>06-22-79<br>06-27-79 | 81-09(05-06-81)            | Closed 3                      |
| Hatch 2        | GPC     | 50-366 | OL              | OL   | II         | GE   | Bechtel | 04-16-79<br>06-22-79<br>06-27-79 | 81-09(05-06-81)            | Closed 3                      |
| Hope Creek 1   | PSE&G   | 50-354 | OL              | CP   | I          | GE   | Bechtel | 05-11-79                         |                            | Closed 2                      |
| Indian Point 2 | ConEd   | 50-247 | OL              | OL   | I          | W    | UE&C    | 04-13-79                         | 83-11(05-11-83)            | Closed 2                      |
| Indian Point 3 | PASNY   | 50-286 | OL              | OL   | I          | W    | UE&C    | 04-13-79<br>04-24-79             |                            | Closed 2                      |
| Kewaunee       | WPS     | 50-305 | OL              | OL   | III        | W    | PS&E    | 04-16-79                         |                            | Closed 2                      |
| LaSalle 1      | CECO    | 50-373 | OL              | CP   | III        | GE   | S&L     | 05-10-79                         | 79-21(06-22-79)            | Closed 2                      |
| LaSalle 2      | CECO    | 50-374 | OL              | CP   | III        | GE   | S&L     | 05-10-79                         | 79-15(06-22-79)            | Closed 2                      |
| Limerick 1     | PECO    | 50-352 | OL              | CP   | I          | GE   | Bechtel | 05-07-79                         | 84-36(08-14-84)            | Closed 1                      |
| Limerick 2     | PECO    | 50-353 | CP              | CP   | I          | GE   | Bechtel | 05-07-79                         | 84-10(08-14-84)            | Closed 1                      |
| Maine Yankee   | MYAPCO  | 50-309 | OL              | OL   | I          | C-E  | S&W     | 03-28-79<br>09-27-79             | 79-11(09-06-79)            | Closed 2                      |
| McGuire 1      | DUPCO   | 50-369 | OL              | CP   | II         | W    | DUPCO   | 05-15-79<br>05-23-79<br>07-02-79 | 80-33(12-11-80)            | Closed 3                      |
| McGuire 2      | DUPCO   | 50-370 | OL              | CP   | II         | W    | DUPCO   | 05-15-79<br>05-23-79<br>07-02-79 | 80-18(12-11-80)            | Closed 3                      |
| Millstone 1    | NNECO   | 50-245 | OL              | OL   | I          | GE   | Ebasco  | 04-16-79                         | 80-17(10-27-80)            | Closed 2                      |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility          | Utility | Docket | Facility Status |      | NRC Region | NSSS | A/E     | Utility Response Date            | Inspection Report and Date | Closeout Status and Criterion |
|-------------------|---------|--------|-----------------|------|------------|------|---------|----------------------------------|----------------------------|-------------------------------|
|                   |         |        | 1988            | 1979 |            |      |         |                                  |                            |                               |
| Millstone 2       | NNECO   | 50-336 | OL              | OL   | I          | C-E  | Bechtel | 04-16-79<br>05-03-79<br>02-20-80 | 80-19(10-27-80)            | Closed 1                      |
| Millstone 3       | NNECO   | 50-423 | OL              | CP   | I          | W    | S&W     | 05-15-79<br>08-02-79             |                            | Closed 3                      |
| Monticello        | NSP     | 50-263 | OL              | OL   | III        | GE   | Bechtel | 04-12-79                         |                            | Closed 2                      |
| Nine Mile Point 1 | NMP     | 50-220 | OL              | OL   | I          | GE   | NMP     | 04-11-79                         |                            | Closed 2                      |
| Nine Mile Point 2 | NMP     | 50-410 | OL              | CP   | I          | GE   | S&W     | 05-16-79<br>06-28-79<br>07-05-79 | 81-06(08-19-81)            | Closed 1                      |
| North Anna 1      | VEPCO   | 50-338 | OL              | OL   | II         | W    | S&W     | 04-16-79                         | 79-28(08-07-79)            | Closed 2                      |
| North Anna 2      | VEPCO   | 50-339 | OL              | CP   | II         | W    | S&W     | 05-10-79<br>06-11-79<br>07-11-79 |                            | Closed 3                      |
| Oconee 1          | DUPCO   | 50-269 | OL              | OL   | II         | B&W  | Bechtel | 04-04-79                         | 79-18(08-09-79)            | Closed 2                      |
| Oconee 2          | DUPCO   | 50-270 | OL              | OL   | II         | B&W  | and     | 04-04-79                         | 79-16(08-09-79)            | Closed 2                      |
| Oconee 3          | DUPCO   | 50-287 | OL              | OL   | II         | B&W  | DUPCO   | 04-04-79                         | 79-18(08-09-79)            | Closed 2                      |
| Oyster Creek 1    | JCP&L   | 50-219 | OL              | OL   | I          | GE   | B&R     | 04-11-79                         | 80-07(03-20-80)            | Closed 2                      |
| Palisades         | CPC     | 50-255 | OL              | OL   | III        | C-E  | Bechtel | 04-16-79<br>05-30-79             |                            | Closed 2                      |
| Palo Verde 1      | APSCO   | 50-528 | OL              | CP   | V          | C-E  | Bechtel | 04-03-79                         | 82-31(12-07-82)            | Closed 1                      |
| Palo Verde 2      | APSCO   | 50-529 | OL              | CP   | V          | C-E  | Bechtel | 04-03-79                         | 82-13(12-07-82)            | Closed 1                      |
| Palo Verde 3      | APSCO   | 50-530 | OL              | CP   | V          | C-E  | Bechtel | 04-03-79                         | 82-14(12-07-82)            | Closed 1                      |
| Peach Bottom 2    | PECO    | 50-277 | OL              | OL   | I          | GE   | Bechtel | 04-09-79<br>06-06-79             | 84-15(06-21-84)            | Closed 2                      |
| Peach Bottom 3    | PECO    | 50-278 | OL              | OL   | I          | GE   | Bechtel | 04-09-79<br>06-06-79             | 84-13(06-21-84)            | Closed 2                      |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility         | Utility | Docket | Facility Status |      | NRC Region | NSSS | A/E     | Utility Response Date | Inspection Report and Date | Closeout Status and Criterion |
|------------------|---------|--------|-----------------|------|------------|------|---------|-----------------------|----------------------------|-------------------------------|
|                  |         |        | 1988            | 1979 |            |      |         |                       |                            |                               |
| Perry 1          | CEI     | 50-440 | OL              | CP   | III        | GE   | Gilbert | 05-02-79              | 83-02(03-07-83)            | Closed 2                      |
| Perry 2          | CEI     | 50-441 | CP              | CP   | III        | GE   | Gilbert | 05-02-79              | 83-02(03-07-83)            | Closed 2                      |
| Pilgrim 1        | BECO    | 50-293 | OL              | OL   | I          | GE   | Bechtel | 04-17-79              | 79-18(10-11-79)            | Closed 2                      |
| Point Beach 1    | WEPCO   | 50-266 | OL              | OL   | III        | W    | Bechtel | 04-26-79              |                            | Closed 2                      |
| Point Beach 2    | WEPCO   | 50-301 | OL              | OL   | III        | W    | Bechtel | 04-26-79              |                            | Closed 2                      |
| Prairie Island 1 | NSP     | 50-282 | OL              | OL   | III        | W    | FPI     | 04-10-79              | 79-19(09-04-79)            | Closed 1                      |
| Prairie Island 2 | NSP     | 50-306 | OL              | OL   | III        | W    | FPI     | 04-10-79              | 79-16(09-04-79)            | Closed 1                      |
| Quad Cities 1    | CECO    | 50-254 | OL              | OL   | III        | GE   | S&L     | 04-12-79              | 79-16(08-21-79)            | Closed 2                      |
| Quad Cities 2    | CECO    | 50-265 | OL              | OL   | III        | GE   | S&L     | 04-12-79              | 79-14(08-21-79)            | Closed 2                      |
| Rancho Seco 1    | SMUD    | 50-312 | OL              | OL   | V          | B&W  | Bechtel | 04-16-79              | 79-11(08-20-79)            | Closed 2                      |
| River Bend 1     | GSU     | 50-458 | OL              | CP   | IV         | GE   | S&W     | 05-18-79<br>11-29-79  | 85-12(04-08-85)            | Closed 2                      |
| Robinson 2       | CP&L    | 50-261 | OL              | OL   | II         | W    | Ebasco  | 04-13-79              | 80-39(03-19-81)            | Closed 3                      |
| Salem 1          | PSE&G   | 50-272 | OL              | OL   | I          | W    | PSE&G   | 04-04-79              | 79-32(02-20-80)            | Closed 2                      |
| Salem 2          | PSE&G   | 50-311 | OL              | CP   | I          | W    | PSE&G   | 04-04-79              | 79-37(02-20-80)            | Closed 2                      |
| San Onofre 1     | SCE     | 50-206 | OL              | OL   | V          | W    | Bechtel | 05-08-79              | 83-01(02-15-83)            | Closed 2                      |
| San Onofre 2     | SCE     | 50-361 | OL              | CP   | V          | C-E  | Bechtel | 05-04-79              | 83-01(02-15-83)            | Closed 1                      |
| San Onofre 3     | SCE     | 50-362 | OL              | CP   | V          | C-E  | Bechtel | 05-04-79              | 83-01(02-15-83)            | Closed 1                      |
| Seabrook 1       | PSNH    | 50-443 | CP              | CP   | I          | W    | UE&C    | 04-11-79<br>07-27-79  | 82-04(07-07-82)            | Closed 1                      |
| Seabrook 2       | PSNH    | 50-444 | CP              | CP   | I          | W    | UE&C    | 04-11-79<br>07-27-79  | 82-04(07-07-82)            | Closed 1                      |
| Sequoyah 1       | TVA     | 50-327 | OL              | CP   | II         | W    | TVA     | 05-14-79<br>06-01-79  | 79-36(08-02-79)            | Closed 2                      |
| Sequoyah 2       | TVA     | 50-328 | OL              | CP   | II         | W    | TVA     | 05-14-79<br>06-01-79  | 79-21(08-02-79)            | Closed 2                      |
| Shoreham         | LILCO   | 50-322 | LPTL            | CP   | I          | GE   | S&W     | 05-16-79<br>07-30-79  | 82-01(01-26-82)            | Closed 3                      |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility         | Utility | Docket | Facility Status |      | NRC Region | NSSS | A/E     | Utility Response Date                        | Inspection Report and Date | Closeout Status and Criterion |
|------------------|---------|--------|-----------------|------|------------|------|---------|--|----------------------------|-------------------------------|
|                  |         |        | 1988            | 1979 |            |      |         |  |                            |                               |
| South Texas 1    | HL&P    | 50-498 | OL              | CP   | IV         | W    | Bechtel | 05-14-79<br>09-17-79                         |                            | Closed 3                      |
| South Texas 2    | HL&P    | 50-499 | CP              | CP   | IV         | W    | Bechtel | 05-14-79<br>09-17-79                         |                            | Closed 3                      |
| St. Lucie 1      | FPL     | 50-335 | OL              | OL   | II         | C-E  | Ebasco  | 04-17-79<br>06-05-79                         |                            | Closed 2                      |
| St. Lucie 2      | FPL     | 50-389 | OL              | CP   | II         | C-E  | Ebasco  | 06-11-79                                     | 79-09(07-03-79)            | Closed 2                      |
| Summer 1         | SCE&G   | 50-395 | OL              | CP   | II         | W    | Gilbert | 05-11-79                                     |                            | Closed 2                      |
| Surry 1          | VEPCO   | 50-280 | OL              | OL   | II         | W    | S&W     | 04-16-79<br>06-01-79                         | 79-33(06-29-79)            | Closed 3                      |
| Surry 2          | VEPCO   | 50-281 | OL              | OL   | II         | W    | S&W     | 04-16-79<br>06-01-79                         | 79-51(06-29-79)            | Closed 3                      |
| Susquehanna 1    | PP&L    | 50-387 | OL              | CP   | I          | GE   | Bechtel | 06-12-79                                     | 79-41(01-30-80)            | Closed 1                      |
| Susquehanna 2    | PP&L    | 50-388 | OL              | CP   | I          | GE   | Bechtel | 06-12-79                                     | 79-22(01-30-80)            | Closed 1                      |
| TMI 1            | Met-Ed  | 50-289 | OL              | OL   | I          | B&W  | Gilbert | 04-13-79<br>09-10-79<br>10-12-79             | 81-26(11-02-81)            | Closed 1                      |
| Trojan           | PGE     | 50-344 | OL              | OL   | V          | W    | Bechtel | 04-20-79                                     | 80-25(11-03-80)            | Closed 2                      |
| Turkey Point 3   | FPL     | 50-250 | OL              | OL   | II         | W    | Bechtel | 04-17-79<br>06-05-79<br>09-07-79<br>10-22-79 | 84-11(04-26-84)            | Closed 1                      |
| Turkey Point 4   | FPL     | 50-251 | OL              | OL   | II         | W    | Bechtel | 04-17-79<br>06-05-79<br>09-07-79<br>10-22-79 | 84-11(04-26-84)            | Closed 1                      |
| Vermont Yankee 1 | VYNP    | 50-271 | OL              | OL   | I          | GE   | Ebasco  | 03-30-79<br>11-26-79                         | 79-21(01-02-80)            | Closed 2                      |

See notes and closeout criteria at end of table.

TABLE B.1 BULLETIN CLOSEOUT STATUS (contd)

| Facility      | Utility | Docket | Facility Status |    | NRC Region | NSSS | A/E     | Utility Response Date                        | Inspection Report and Date | Closeout Status and Criterion |
|---------------|---------|--------|-----------------|----|------------|------|---------|--|----------------------------|-------------------------------|
| Vogtle 1      | GP      | 50-424 | OL              | CP | II         | W    | SS/Bech | 05-09-79                                     | 85-35(12-11-85)            | Closed 3                      |
| Vogtle 2      | GP      | 50-425 | CP              | CP | II         | W    | SS/Bech | 05-09-79                                     |                            | Closed 3                      |
| Waterford 3   | LP&L    | 50-382 | OL              | CP | IV         | C-E  | Ebasco  | 05-04-79                                     |                            | Closed 2                      |
| Watts Bar 1   | TVA     | 50-390 | CP              | CP | II         | W    | TVA     | 05-14-79<br>07-13-79<br>09-13-79<br>11-29-79 | 84-35(06-20-84)            | Closed 3                      |
| Watts Bar 2   | TVA     | 50-391 | CP              | CP | II         | W    | TVA     | 05-14-79<br>07-13-79<br>09-13-79<br>11-29-79 | 84-33(06-20-84)            | Closed 3                      |
| WNP 2         | WPPSS   | 50-397 | OL              | CP | V          | GE   | B&R     | 06-06-79                                     |                            | Closed 2                      |
| Wolf Creek 1  | KG&E    | 50-482 | OL              | CP | IV         | W    | Bechtel | 05-11-79<br>07-30-79<br>10-05-79<br>08-20-80 | 83-01(02-24-83)            | Closed 1                      |
| Yankee-Rowe 1 | YAECO   | 50-029 | OL              | OL | I          | W    | S&W     | 04-04-79<br>09-07-79                         |                            | Closed 2                      |
| Zion 1        | CECO    | 50-295 | OL              | OL | III        | W    | S&L     | 04-12-79                                     |                            | Closed 2                      |
| Zion 2        | CECO    | 50-304 | OL              | OL | III        | W    | S&L     | 04-12-79                                     |                            | Closed 2                      |

## Notes:

1. Facility status is based on Reference 1, Page B-9.
2. The following abbreviations apply to facility status:  
CP, construction permit; LPTL, low power testing license; OL, operating license.
3. Bulletin closeout criteria are listed on Page B-9.



#### CRITERIA FOR CLOSEOUT OF BULLETIN

1. The bulletin is closed for a facility if the utility response and an NRC/Region inspection report indicate that actions required by the bulletin (see Page A-2) have been completed satisfactorily.
2. The bulletin is closed for a facility if the utility response includes a statement that the facility has no piping of bulletin concern in safety-related systems or planned for such use.
3. The bulletin is closed for a facility on the basis of the closeout of superseding Bulletin 79-03A (see Report NUREG/CR-5284).

#### REFERENCE

1. United States Nuclear Regulatory Commission, Licensed Operating Reactors, Status Summary Report, Data as of 10-31-88, NUREG-0020, Volume 12, Number 11, November 1988.

## APPENDIX C

### Abbreviations

|        |   |
|--------|---|
| A/E    | Architect/Engineer                            |
| AEPSCO | American Electric Power Services Corporation  |
| APCO   | Alabama Power Company                         |
| AP&L   | Arkansas Power and Light Company              |
| APSCO  | Arizona Public Service Company                |
| ASME   | American Society of Mechanical Engineers, The |
| Bech   | Bechtel Power Corporation                     |
| BECO   | Boston Edison Company                         |
| BG&E   | Baltimore Gas and Electric Company            |
| B&R    | Burns & Roe, Inc.                             |
| B&W    | Babcock & Wilcox Company                      |
| C-E    | Combustion Engineering Incorporated           |
| CECO   | Commonwealth Edison Company                   |
| CEI    | Cleveland Electric Illuminating Company       |
| CFR    | Code of Federal Regulations                   |
| ConEd  | Consolidated Edison Company of New York, Inc. |
| CP     | Construction Permit                           |
| CPC    | Consumers Power Company                       |
| CP&L   | Carolina Power and Light Company              |
| CR     | Contractor Report                             |
| CYAPCO | Connecticut Yankee Atomic Power Company       |
| DECO   | Detroit Edison Company                        |
| DLC    | Duquesne Light Company                        |
| DUPCO  | Duke Power Company                            |
| FPC    | Florida Power Corporation                     |
| FPL    | Florida Power & Light Company                 |
| FPI    | Fluor Pioneer, Inc.                           |
| GA     | General Atomic                                |
| GAO    | Government Accounting Office                  |
| GE     | General Electric Company                      |
| G&H    | Gibbs & Hill Inc.                             |
| GPC    | Georgia Power Company                         |
| GPUN   | GPU Nuclear Corporation                       |
| GSU    | Gulf States Utilities Company                 |
| HL&P   | Houston Lighting and Power Company            |
| IE     | (See NRC/IE)                                  |
| IEB    | Inspection and Enforcement Bulletin (NRC)     |
| IELPCO | Iowa Electric Light and Power Company         |
| IMECO  | Indiana and Michigan Electric Company         |

|        |  |
|--------|--|
| IP     | Illinois Power Company   |
| IR     | Inspection Report (NRC/Region)                                       |
| KG&E   | Kansas Gas and Electric Company                                      |
| LER    | Licensee Event Report  |
| LILCO  | Long Island Lighting Company   |
| LP&L   | Louisiana Power and Light Company                                    |
| LPTL   | Low Power Testing License  |
| MP&L   | Mississippi Power and Light Company                                  |
| MYAPCO | Maine Yankee Atomic Power Company                                    |
| NMP    | Niagara Mohawk Power Company   |
| NNECO  | Northeast Nuclear Energy Company                                     |
| NPPD   | Nebraska Public Power District                                       |
| NRC/IE | Nuclear Regulatory Commission/<br>Office of Inspection & Enforcement |
| NRR    | Office of Nuclear Reactor Regulation (NRC)                           |
| NSP    | Northern States Power Company  |
| NSSS   | Nuclear Steam Supply System  |
| NU     | Northeast Utilities  |
| NYP&A  | New York Power Authority   |
| OL     | Operating License  |
| OPPD   | Omaha Public Power District  |
| 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                                   |
| PSE&G  | Public Service Electric and Gas Company                              |
| PS&E   | Pioneer Services & Engineering                                       |
| PSNH   | Public Service Company of New Hampshire                              |
| R      | Region (NRC)   |
| RG&E   | Rochester Gas and Electric Corporation                               |
| SCE    | Southern California Edison Company                                   |
| SCE&G  | South Carolina Electric and Gas Company                              |
| S&L    | Sargent & Lundy Engineers  |
| SMUD   | Sacramento Municipal Utility District                                |
| SNUPPS | Standardized Nuclear Unit Power Plant Systems                        |
| SS     | Southern Services Incorporated                                       |
| S&W    | Stone & Webster Engineering Corporation                              |
| TECO   | Toledo Edison Company  |
| TMI    | Three Mile Island  |
| TUGCO  | Texas Utilities Generating Company                                   |

|       |  |
|-------|--|
| TVA   | Tennessee Valley Authority               |
| UE    | Union Electric Company                   |
| UE&C  | United Engineers & Constructors Inc.     |
| VEPCO | Virginia Electric and Power Company      |
| VYNP  | Vermont Yankee Nuclear Power Corporation |
| <br>  |  |
| W     | Westinghouse Electric Corporation        |
| WEPCO | Wisconsin Electric Power Company         |
| WNP   | Washington Nuclear Project               |
| WNSD  | Westinghouse Nuclear Service Division    |
| WPPSS | Washington Public Power Supply System    |
| <br>  |  |
| WPS   | Wisconsin Public Service Corporation     |
| YAECO | Yankee Atomic Electric Company           |

**BIBLIOGRAPHIC DATA SHEET**

SEE INSTRUCTIONS ON THE REVERSE

1. REPORT NUMBER (Assigned by PPMS: DPS, add Vol. No., if any)

NUREG/CR-5283  
PARAMETER IE-174

2. TITLE AND SUBTITLE

Closeout of IE Bulletin 79-03: Longitudinal  
Weld Defects in ASME SA-312 Type 304 Stainless  
Steel Pipe Spools Manufactured by Youngstown  
Welding and Engineering Company

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12. SUPPLEMENTARY NOTES

13. ABSTRACT (200 words or less)

Documentation is provided in this report for the closeout of IE Bulletin 79-03, on the subject of fusion welded austenitic stainless steel pipe (without filler metal) manufactured by the Youngstown Welding and Engineering Company. Only pipe used or planned for use in safety-related systems is considered. The bulletin is closed out on the basis of definite criteria for all of the 121 facilities for which actions were required. This bulletin was issued by the NRC on March 12, 1979 to require certain actions by all holders of operating licenses and construction permits for power reactors. The NRC's concern was based on the discoveries of faulty longitudinal welds at Palo Verde and San Onofre. The investigations for Bulletin 79-03 led to the finding that volumetric examination of the fusion welds per the ASME Code requirements did not assure detection of centerline lack of penetration (CLP). Therefore, the problem of faulty welds applied to all manufacturers of SA-312/A-312 Type 300 Series welded steel pipe. Bulletin 79-03A was issued on April 4, 1980 to supersede the required actions of Bulletin 79-03, and to collect information on all of the subject pipe and fittings in safety-related systems. Refer to NUREG/CR-5284 for the companion closeout report on IE Bulletin 79-03A, "Longitudinal Weld Defects in ASME SA-312 Type 304 Stainless Steel Pipe". Background information is provided in the Introduction and Appendix A of this report as well as NUREG/CR-5284.

14. DOCUMENT ANALYSIS - a. KEYWORDS/DESCRIPTORS

Closeout of IE Bulletin 79-03  
Longitudinal Weld Defects  
Stainless Steel Pipe Spools

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**CLOSEOUT OF IE BULLETIN 79-03: LONGITUDINAL WELD DEFECTS IN  
ASME SA-312 TYPE 304 STAINLESS STEEL PIPE SPOOLS  
MANUFACTURED BY YOUNGSTOWN WELDING AND ENGINEERING CO.**

APRIL 1989

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