P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

L-2004-160
10 CFR 50.54(f)

JUL 2 7 2004

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington DC 20555

RE: Florida Power and Light Company
St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251

FPL Energy Seabrook, LLC
Seabrook Station
Docket No. 50-443

**NRC Bulletin 2004-01**
**Inspection of Alloy 82/182/600 Materials Used In The Fabrication of Pressurizer Penetrations And Steam Space Piping Connections At Pressurized-Water Reactors**

On May 28, 2004, the NRC issued Bulletin (NRCB) 2004-01, "Inspection of Alloy 82/182/600 Materials Used in Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors." Florida Power & Light Company (FPL), the licensee for the St. Lucie Nuclear Plant, Units 1 and 2, and the Turkey Point Nuclear Plant, Units 3 and 4, and FPL Energy Seabrook, LLC (FPL Energy Seabrook) the licensee for Seabrook Station hereby submit their response to the Bulletin.

Licensees for pressurized-water nuclear power reactors (PWRs) were requested to provide the NRC with information related to the materials from which the pressurizer penetrations and steam space piping connections at their facilities were fabricated. Licensees were also requested to provide the NRC with information related to the inspections that have been and those that will be performed to ensure that degradation of Alloy 82/182/600 materials used in the fabrication of pressurizer penetrations and steam space piping connections will be identified, adequately characterized, and repaired. Attachment 1 provides the requested information for FPL St. Lucie Unit 1 and Unit 2. Attachment 2 provides the requested information for FPL Turkey Point Unit 3 and 4. Attachment 3 provides the requested information for FPL Energy Seabrook.

The attached information is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended and 10 CFR 50.54(f).

Please contact Rajiv S. Kundalkar at (561) 694-4848 if you have any additional questions regarding these responses.

Sincerely yours,

for Rajiv S. Kundalkar

J. A. Stall
Senior Vice President, Nuclear and
Chief Nuclear Officer

A110

Attachments (3)

STATE OF FLORIDA )
)ss.
COUNTY OF PALM BEACH )

R. S. Kundalkar being first duly sworn, deposes and says:

That he is Vice President, Nuclear Engineering of Florida Power and Light Company and FPL Energy Seabrook, LLC, the Licensees herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensees.

Rajiv S. Kundalkar
R. S. Kundalkar

Subscribed and sworn to before me this
21st day of July, 2004

Judith Ann Creasman
Name of Notary Public (Type of Print)

OFFICIAL NOTARY SEAL
JUDITH ANN CREASMAN
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC980677
MY COMMISSION EXP. DEC. 5,2004

R. S. Kundalkar is personally known to me.

# ATTACHMENT 1

## St. Lucie Units 1 and 2 Response
## NRC Bulletin 2004-01

## NRC BULLETIN 2004-01: "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED WATER REACTORS."

### Requested Information

On May 28, 2004, the Nuclear Regulatory Commission (NRC) issued Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized Water Reactors." The NRC requested that specific information be provided within 60 days of the date of the Bulletin. Florida Power and Light Company (FPL) hereby responds to the 60-day information request set forth in the Bulletin with respect to St. Lucie Units 1 and 2.

*NRC Request: All subject PWR addressees are requested to provide the following information within 60 days of the date of this bulletin.*

*NRC Request 1(a): A description of the pressurizer penetrations and steam space piping connections at your plant. At a minimum, this description should include materials of construction (e.g., stainless steel piping and/or weld metal, Alloy 600 piping/sleeves, Alloy 82/182 weld metal or buttering, etc.), joint design (e.g., partial penetration welds, full penetration welds, bolted connections, etc.), and, in the case of welded joints, whether or not the weld was stress-relieved prior to being put into service. Additional information relevant with respect to determining the susceptibility of your plant's pressurizer penetrations and steam space piping connections to PWSCC should also be included.*

**St. Lucie Unit 1 and Unit 2 Response to Request 1(a):** The pressurizer penetrations/nozzles and steam space piping connections for St. Lucie Units 1 and 2 are identified in Tables 1 and 2, respectively. The final alloy 600 welds were not stress relieved prior to being put into service. However, the alloy 182 butt weld end prep buttering on the spray, relief, safety (3), and surge nozzles, and the internal J-groove buttering preparation on the pressurizer shell were stress relieved so that the final pressure boundary weld could be made without stress relief.

*NRC Request 1(b): A description of the inspection program for Alloy 82/182/600 pressurizer penetrations and steam space piping connections that has been implemented at your plant. The description should include when the inspections were performed; the areas, penetrations and steam space piping connections inspected; the extent (percentage) of coverage achieved for each location which was inspected; the inspection methods used; the process used to resolve any inspection findings; the quality of the documentation of the inspections (e.g., written report, video record, photographs); and, the basis for concluding that your plant satisfies applicable regulatory requirements related to the integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections were*

*found, indicate what follow-up NDE was performed to characterize flaws in the leaking penetrations.*

**St. Lucie Response to NRC Request 1(b):**

**St. Lucie Unit 1:** St. Lucie Unit 1 performed a 100% bare metal visual examination (VT-2) of all the alloy 82/182/600 pressurizer penetrations and butt welds in the spring of 2004 with no identified leakage. These examinations were performed by FPL to follow the MRP recommendation[1] and to meet the WOG commitment,[2] made on behalf of licensees of CE Nuclear Steam Supply Systems (NSSS), to address concerns with alloy 82/182/600 pressure boundary materials. The examination area for the most recent bare metal visual examinations included 100% of the circumference of the weld or penetration area of interest. Prior to the Spring 2004 refueling outage (RFO), FPL had been performing either complete or partial bare metal visual examinations of all the pressurizer small bore penetrations (120 heater sleeves and 7 instrument nozzles). These inspections were performed for every RFO since 1990. Inspection details have been provided in a Westinghouse Owners Group letter to the NRC.[3] The documentation for these examinations includes written reports and photographs. There have been no pressurizer leaks in any of the Unit 1 welded penetrations or butt welded pipe/nozzle connections.

In addition, the alloy 600 butt welds are inspected in accordance with the ASME Section XI In-service Inspection (ISI) program. These ASME Section XI Code required examinations included the weld and required volume to the maximum extent achievable. The most recent ASME Section XI examinations for these pressurizer welds are listed in the following table:

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[1] MRP Letter 2003-039, "Recommendation for Inspection of Alloy 600/82/182 Pressure Boundary Components," Leslie Hartz, Chair, MRP Senior Representatives, Dominion Generation to PWR Owners, January 20, 2004. (ADAMS Accession # ML040360483)

[2] WOG Letter 2004-057, "WOG CE Fleet Pressurizer Heater Sleeve Inspection Program," F. P. Schiffley II, Chairman, Westinghouse Owners Group to NRC, January 30, 2004. (ADAMS Accession # ML040480309)

[3] WOG Letter 2003-643, "WOG CE Fleet Operability Assessment Regarding Pressurizer Heater Sleeves," F. P. Schiffley II, Chairman, Westinghouse Owners Group to NRC, December 23, 2003. (ADAMS Accession # ML033650391)

**St. Lucie Unit 1 Pressurizer (PZR) Most Recent ASME ISI Program Examinations**

| Pressurizer Connection | Inspection Method | Inspection Year | Code Coverage | Inspection Results |
|---|---|---|---|---|
| Safety Nozzle A | Surface | 2002 & 1990 | 100% | Acceptable |
| Safety Nozzle A | Volumetric | 1990 | >90% CRV | Acceptable |
| Safety Nozzle B | Surface | 2002 & 1996 | 100% | Acceptable |
| Safety Nozzle B | Volumetric | 1996 | >90% CRV | Acceptable |
| Safety Nozzle C | Surface | 2002 & 1996 | 100% | Acceptable |
| Safety Nozzle C | Volumetric | 1996 | >90% CRV | Acceptable |
| Relief Nozzle | Surface | 2002 | 100% | Acceptable |
| Relief Nozzle | Volumetric | 2002 | >90% CRV | Acceptable |
| Surge Nozzle | Surface | 1999 | 100% | Acceptable |
| Surge Nozzle | Volumetric | 1999 | 100% CRV | Acceptable |
| Spray Nozzle | Surface | 2002 | 100% | Acceptable |
| Spray Nozzle | Volumetric | 2002 | 100% CRV | Acceptable |

There has been no evidence of leakage, and no reportable or recordable flaws identified by these ASME Code pressurizer examinations. All examinations have been performed in accordance with the ASME Section XI program since the beginning of plant operation, including pre-service.

**St. Lucie Unit 2:** FPL has been performing either complete or partial bare metal visual examinations of all the pressurizer small bore penetrations (30 heater sleeves and 7 instrument nozzles) every RFO since 1990. Inspection details were provided in a Westinghouse Owners Group letter to the NRC.[3] The documentation for these examinations includes written reports.

There have been two events of leakage resulting from cracked pressurizer instrument nozzles or J-groove welds. In 1993 there were leaks identified from four alloy 600 steam space instrument nozzles (LER 389-93-004). Dye penetrant (PT) examinations were performed from the pressurizer ID on the J-groove welds and parts of the nozzle bore to reveal axial cracking in the bore that extended into the welds. Eddy Current testing of the leaking nozzles confirmed the axial orientation of the flaws in the instrument nozzles. The nozzles were replaced using an alloy 690 nozzle with the original J-groove weld design using alloy 182 filler material. In 1994 there was a leak identified from one of the four steam space instrument nozzles replaced in 1993 (LER 389-94-002). PT examinations of all four instrument nozzles and welds replaced in 1993 revealed cracking in the alloy 182 J-groove weld material at 3 nozzle locations. There were no indications in the alloy 690 nozzle material. All leaking nozzles were replaced with alloy 690 nozzles.

In addition, the alloy 600 butt welds are inspected in accordance with the ASME Section XI In-service Inspection (ISI) program. These ASME Section XI Code required examinations included the weld and required volume to the maximum extent achievable. The most recent ASME Section XI examinations for these pressurizer welds are listed in the following table:

**St. Lucie Unit 2 Pressurizer Most Recent Butt Weld ISI Program Examinations**

| Pressurizer Connection | Inspection Method | Inspection Year | Code Coverage | Inspection Results |
|---|---|---|---|---|
| Safety Nozzle A | Surface | 1995 | 100% | Acceptable |
| Safety Nozzle A | Volumetric | 1995 | >90% CRV | Acceptable |
| Safety Nozzle B | Surface | 1995 | 100% | Acceptable |
| Safety Nozzle B | Volumetric | 1995 | >90% CRV | Acceptable |
| Safety Nozzle C | Surface | 1995 | 100% | Acceptable |
| Safety Nozzle C | Volumetric | 1995 | >90% CRV | Acceptable |
| Relief Nozzle | Surface | 1995 | 100% | Acceptable |
| Relief Nozzle | Volumetric | 1995 | 81% CRV | Acceptable |
| Surge Nozzle | Surface | 1994 | 100% | Acceptable |
| Surge Nozzle | Volumetric | 1994 | 100% CRV | Acceptable |
| Spray Nozzle | Surface | 1995 | 100% | Acceptable |
| Spray Nozzle | Volumetric | 1995 | 100% CRV | Acceptable |

Other than the 1993 and 1994 events identified above, there has been no evidence of leakage and no reportable, or recordable, flaws identified by these ASME Code pressurizer examinations. All examinations have been performed in accordance with the ASME Section XI program since the beginning of plant operation, including pre-service.

**Basis for concluding that your plant will satisfy applicable regulatory requirements:** The basis for concluding that St. Lucie Units 1 and 2 pressurizer penetrations and connected steam piping satisfy applicable regulatory requirements related to their integrity is provided in Section 3, Regulatory Requirements, of MRP-48.[4] Although the MRP-48 response was provided for the upper reactor vessel head alloy 600 penetrations (NRC Bulletin 2001-01), the materials are the same and the responses are applicable. In addition, all examinations of these pressurizer alloy 82/182/600 locations are performed to written procedures by qualified personnel. The St. Lucie corrective action program will be used to disposition all findings of potential leakage.

*NRC Request 1(c): A description of the Alloy 82/182/600 pressurizer penetration and steam space piping connection inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the areas, penetrations and steam space piping connections to be inspected; the extent (percentage) of coverage to be achieved for each location; inspection methods to be used; qualification standards for the inspection methods and personnel; the process used to resolve any inspection indications; the inspection documentation to be generated; and the basis for concluding that your plant will satisfy applicable regulatory requirements related to the structural and leakage integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections are found, indicate what follow-up NDE will be performed to characterize flaws in the leaking penetrations. Provide your plans for expansion of the scope of NDE to be performed if circumferential flaws are found in any portion of the leaking pressurizer penetrations or steam space piping connections.*

[4] EPRI Document MRP-48, "PWR Materials Reliability Program Response to NRC Bulletin 2001-01 (MRP-48)," EPRI, Palo Alto, CA, August 2001. (1006284)

**St. Lucie Response to NRC Request 1(c):**

**St. Lucie Unit 1:** FPL has performed a bare metal visual examination (VT-2) of all the pressurizer penetrations as identified in the response to request 1(b) above. At the next refueling outage (fall 2005), FPL plans to replace the St. Lucie Unit 1 pressurizer. No examinations of the retired pressurizer are planned, other than the normal boric acid leak inspection program after shutdown of the unit. This inspection is performed with the insulation in place. Alloy 82/182/600 materials will not be used in any of the St. Lucie Unit 1 replacement pressurizer penetrations. Subsequent examinations of the replacement pressurizer will follow the required ASME Code Section XI inspection plan.

Should the pressurizer replacement be delayed, subsequent bare metal VT-2 examinations of the alloy 600 pressurizer heater sleeves and instrument nozzles will be performed every RFO, as identified in the WOG commitment letter.[2] Subsequent bare metal VT-2 examinations of the alloy 182 spray, safety, relief and surge nozzle butt welds will follow a frequency to be identified by the ASME Code, EPRI MRP or regulatory action.

**St. Lucie Unit 2:** FPL will perform a 100% bare metal visual examination (VT-2) of all the alloy 82/182/600 pressurizer penetrations and butt welds identified in Table 2 in the fall of 2004. These examinations were scheduled by FPL to follow the MRP recommendation[1] and to meet the WOG commitment,[2] made on behalf of licensees of CE NSSS, to address concerns with alloy 82/182/600 pressure boundary materials. These planned inspections also address the scope of this Bulletin. The examination area will include 100% of the weld surface (butt welds) or 100% of the circumference of the nozzle as it penetrates the pressurizer shell. Personnel will be VT-2 qualified.

Subsequent bare metal VT-2 examinations of the alloy 600 pressurizer heater sleeves will be performed every RFO, as identified in the WOG commitment letter.[2] Subsequent bare metal VT-2 examinations of the alloy 182 spray, safety, relief and surge nozzle butt weld will follow a frequency to be identified by the ASME Code, EPRI MRP or regulatory action.

**Basis for concluding that your plant will satisfy applicable regulatory requirements:** See the response to question 1(b) above.

**Flaw characterization and NDE flaw expansion:** In the event that leakage is identified from an alloy 82/182/600 pressurizer penetration or piping connection, NDE will be performed to determine the orientation of the flaw. The NDE method will be chosen based on the joint configuration containing the flaw. FPL will utilize the condition report process to evaluate all findings of leakage during the pressurizer examinations outlined above. The process will include evaluations to determine if the findings of leakage are relevant or non-relevant as an RCS leak and to identify the source of the leakage.

If the NDE of these alloy 82/182/600 materials defines a flaw as potential circumferential cracking, the NRC will be notified and an appropriate inspection plan will be developed. The plan will define expansion of NDE sufficient to determine the extent of condition commensurate with the characterization of the flaw.

*NRC Request 1(d): In light of the information discussed in this bulletin and your understanding of the relevance of recent industry operating experience to your facility, explain why the inspection program identified in your response to item (1)(c) above is adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.*

**St. Lucie Unit 1 and Unit 2 Response to NRC Request 1(d):** The recent alloy 82/182/600 pressurizer operating experience (OE) cited in NRC Bulletin 2004-01 has been considered and an appropriate initial inspection program has been developed based on the MRP recommendation letter[1] and the WOG commitment letter[2] to address concerns with alloy 82/182/600 pressure boundary materials. As identified above, St. Lucie Units 1 and 2 are committed to performing the inspections identified in these two reference documents. The bare metal visual inspections combined with the periodic ASME Section XI examinations are adequate for the purpose of verifying that the integrity of the alloy 82/182/600 pressurizer penetrations and connected piping/welds are maintained.

*NRC Request 2. Within 60 days of plant restart following the next inspection of the Alloy 82/182/600 pressurizer penetrations and steam space piping connections, the subject PWR licensees should either:*

*(a) submit to the NRC a statement indicating that the inspections described in the licensee's response to item (1)(c) of this bulletin were completed and a description of the as-found condition of the pressurizer shell, any findings of relevant indications of through-wall leakage, follow-up NDE performed to characterize flaws in leaking penetrations or steam space piping connections, a summary of all relevant indications found by NDE, a summary of the disposition of any findings of boric acid, and any corrective actions taken and/or repairs made as a result of the indications found, or*

*(b) if the licensee was unable to complete the inspections described in response to item (1)(c) of this bulletin, submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the pressurizer shell, any findings of relevant indications of through-wall leakage, follow-up NDE performed to characterize flaws in leaking penetrations or steam space piping connections, a summary of all relevant indications found by NDE, a summary of the disposition of any findings of boric acid, and any corrective actions taken and/or repairs made as a result of the indications found. In addition, supplement the answer which you provided to item (1)(d) above to explain why the inspections that you completed were adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.*

**St. Lucie Unit 1 and Unit 2 Response to NRC Request 2:** FPL will provide the requested information within 60 days after plant restart following the next examination at each St. Lucie unit. No report will be provided for St. Lucie Unit 1, if the pressurizer is replaced as planned. The new St. Lucie Unit 1 pressurizer will not contain any alloy 82/182/600 materials, therefore, it is outside the scope of this bulletin.

**Table 1: ST. LUCIE UNIT 1 PRESSURIZER PENETRATION AND STEAM SPACE PIPING MATERIALS AND DESIGN DETAILS**

| Pressurizer Penetration/Piping Component | Qty | Material Type | Weld Joint Design | Size (Inches) |
|---|---|---|---|---|
| Spray Nozzle Assembly Consisting of: | 1 | | | 3.438" ID |
| Spray Nozzle (Integral) Clad Lined | 1 | Carbon/Alloy Steel | Material | |
| Spray Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering Weld | |
| Spray Nozzle End Prep to Safe End Weld | 1 | Alloy 182 weld | Full Pen Butt Joint | |
| Spray Nozzle Safe End/Pipe | 1 | Stainless Steel | Material | |
| Spray Nozzle Safe End to Spray Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Relief Nozzle Assembly Consisting of: | 1 | | | 3.438" ID |
| Relief Nozzle (Integral) Clad Lined | 1 | Carbon/Alloy Steel | Material | |
| Relief Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering Weld | |
| Relief Nozzle End Prep to Safe End Weld | 1 | Alloy 182 weld | Full Pen Butt Joint | |
| Relief Nozzle Safe End/Pipe | 1 | Stainless Steel | Material | |
| Relief Nozzle Safe End to Relief Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Relief Pipe | 1 | Stainless Steel | Material | |
| Safety Nozzle Assembly Consisting of: | 3 | | | 2.938" ID. |
| Safety Valve Nozzle (Integral) Clad Lined | 3 | Carbon/Alloy Steel | Material | |
| Safety Valve Nozzle Weld End Prep Buildup (butter) | 3 | Alloy 182 weld | Buttering Weld | |
| Safety Valve Nozzle End Prep to Flange Weld | 3 | Alloy 182 weld | Full Pen Butt Joint | |
| Safety Valve Nozzle Flange | 3 | Stainless Steel | Material | |
| Surge Nozzle Assembly Consisting of: | 1 | | | 9.75" ID |
| Surge Nozzle (Integral) Clad Lined | 1 | Carbon/Alloy Steel | Material | |
| Surge Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering Weld | |
| Surge Nozzle End Prep to Safe End Weld | 1 | Alloy 182 weld | Full Pen Butt Joint | |
| Surge Nozzle Safe End/Pipe | 1 | Stainless Steel | Material | |
| Surge Nozzle Safe End to Surge Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Steam Space Level/Pressure Instrument Nozzles Consisting of: | 4 | | | 0.815" ID |
| Instrument Nozzles | 4 | Alloy 690 | Material | |
| Instrument Nozzle to Safe End Weld | 4 | Alloy 52 (690) | Full Pen Butt Joint | |
| Instrument Nozzle Safe End | 4 | Stainless Steel | Material | |
| Instrument Nozzle to Vessel Weld | 4 | Alloy 52 (690) | Ext. Pad Weld & Part Pen J-Groove | |
| Instrument Nozzle to Piping Weld | 4 | Stainless Steel | Socket Weld | |
| Instrument Nozzle Piping | 4 | Stainless Steel | Material | |
| Water Space Level & Temperature Instrument Nozzles Consisting of: | 3 | | | 0.815" ID |
| Instrument Nozzles | 3 | Alloy 600 | Material | |
| Instrument Nozzle to Safe End Weld | 3 | Alloy 82/182 | Full Pen Butt Joint | |
| Instrument Nozzle Safe End | 3 | Stainless Steel | Material | |
| Instrument Nozzle to Vessel Weld | 3 | Alloy 82/182 | Internal Part Pen J-Groove | |
| Instrument Nozzle to Piping Weld | 2 | Stainless Steel | Socket Weld | |
| Instrument Nozzle to Thermocouple Weld | 1 | Stainless Steel | Socket Weld | |
| Instrument Nozzle Piping | 2 | Stainless Steel | Material | |
| Instrument Nozzle Connected Thermocouple | 1 | Stainless Steel | Material | |
| Heater Sleeve (Mitigated with nickel plating on the ID surface) | 120 | Alloy 600/ Ni Plated | Material | 0.905" ID |
| Heater Sleeve to Pressurizer Vessel (buttered Vessel Prep) | 120 | Alloy 182 weld | Internal Part Pen J-Groove | |

**Table 2: ST. LUCIE UNIT 2 PRESSURIZER PENETRATION AND STEAM SPACE PIPING MATERIALS AND DESIGN DETAILS**

| Pressurizer Penetration/Piping Component | Qty | Material Type | Weld Joint Design | Size (Inches) |
|---|---|---|---|---|
| Spray Nozzle Assembly Consisting of: | 1 | | | 3.438" ID |
| Spray Nozzle (Integral) Clad Lined | 1 | Carbon/Alloy Steel | Material | |
| Spray Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering Weld | |
| Spray Nozzle End Prep to Safe End Weld | 1 | Alloy 182 weld | Full Pen Butt Joint | |
| Spray Nozzle Safe End/Pipe | 1 | Stainless Steel | Material | |
| Spray Nozzle Safe End to Spray Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Relief Nozzle Assembly Consisting of: | 1 | | | 3.438" ID |
| Relief Nozzle (Integral) Clad Lined | 1 | Carbon/Alloy Steel | Material | |
| Relief Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering Weld | |
| Relief Nozzle End Prep to Safe End Weld | 1 | Alloy 182 weld | Full Pen Butt Joint | |
| Relief Nozzle Safe End/Pipe | 1 | Stainless Steel | Material | |
| Relief Nozzle Safe End to Relief Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Relief Pipe | 1 | Stainless Steel | Material | |
| Safety Nozzle Assembly Consisting of: | 3 | | | 2.938" ID |
| Safety Valve Nozzle (Integral) Clad Lined | 3 | Carbon/Alloy Steel | Material | |
| Safety Valve Nozzle Weld End Prep Buildup (butter) | 3 | Alloy 182 weld | Buttering Weld | |
| Safety Valve Nozzle End Prep to Flange Weld | 3 | Alloy 182 weld | Full Pen Butt Joint | |
| Safety Valve Nozzle Flange | 3 | Stainless Steel | Material | |
| Surge Nozzle Assembly Consisting of: | 1 | | | 9.75" ID |
| Surge Nozzle (Integral) Clad Lined | 1 | Carbon/Alloy Steel | Material | |
| Surge Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering Weld | |
| Surge Nozzle End Prep to Safe End Weld | 1 | Alloy 182 weld | Full Pen Butt Joint | |
| Surge Nozzle Safe End/Pipe | 1 | Stainless Steel | Material | |
| Surge Nozzle Safe End to Surge Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Steam Space Level/Pressure Instrument Nozzles Consisting of: | 4 | | | 0.815" ID |
| Instrument Nozzles | 4 | Alloy 690 | Material | |
| Instrument Nozzle to Safe End Weld | 4 | Alloy 52 (690) | Full Pen Butt Joint | |
| Instrument Nozzle Safe End | 4 | Stainless Steel | Material | |
| Instrument Nozzle to Vessel Weld | 4 | Alloy 52 (690) | Ext. Pad Weld & Part Pen J-Groove | |
| Instrument Nozzle to Piping Weld | 4 | Stainless Steel | Socket Weld | |
| Instrument Nozzle Piping | 4 | Stainless Steel | Material | |
| Water Space Level & Temperature Instrument Nozzles Consisting of: | 3 | | | 0.815" ID |
| Instrument Nozzles | 3 | Alloy 690 | Material | |
| Instrument Nozzle to Safe End Weld | 3 | Alloy 52 (690) | Full Pen Butt Joint | |
| Instrument Nozzle Safe End | 3 | Stainless Steel | Material | |
| Instrument Nozzle to Vessel Weld (See Note below) | 3 | Alloy 52 (690) | Ext. Pad Weld & Part Pen J-Groove | |
| Instrument Nozzle to Piping Weld | 2 | Stainless Steel | Socket Weld | |
| Instrument Nozzle to Thermocouple Weld | 1 | Stainless Steel | Socket Weld | |
| Instrument Nozzle Piping | 2 | Stainless Steel | Material | |
| Instrument Nozzle Connected Thermocouple | 1 | Stainless Steel | Material | |
| Heater Sleeve | 30 | Alloy 600 | Material | 1.273" ID |
| Heater Sleeve to Pressurizer Vessel (buttered Vessel Prep) | 30 | Alloy 182 weld | Internal Part Pen J-Groove | |

Note: One instrument nozzle pad to vessel weld is alloy 82.

# ATTACHMENT 2

## Turkey Point Plant Units 3 and 4 Response
## NRC Bulletin 2004-01

## NRC BULLETIN 2004-01: "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED WATER REACTORS."

### Requested Information

On May 28, 2004, the Nuclear Regulatory Commission (NRC) issued Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized Water Reactors." The NRC requested that specific information be provided within 60 days of the date of the Bulletin. Florida Power and Light Company (FPL) hereby responds to the 60-day information request set forth in the Bulletin with respect to Turkey Point Units 3 and 4.

*NRC Request: All subject PWR addressees are requested to provide the following information within 60 days of the date of this bulletin.*

*NRC Request 1(a): A description of the pressurizer penetrations and steam space piping connections at your plant. At a minimum, this description should include materials of construction (e.g., stainless steel piping and/or weld metal, Alloy 600 piping/sleeves, Alloy 82/182 weld metal or buttering, etc.), joint design (e.g., partial penetration welds, full penetration welds, bolted connections, etc.), and, in the case of welded joints, whether or not the weld was stress-relieved prior to being put into service. Additional information relevant with respect to determining the susceptibility of your plant's pressurizer penetrations and steam space piping connections to PWSCC should also be included.*

**Turkey Point Response to Request 1(a):** The pressurizer penetrations/nozzles and steam space piping connections for Turkey Point Units 3 and 4 contain all stainless steel or stainless steel clad lined low alloy steel (for the integral full penetration nozzles). The stainless steel full penetration welds to the stainless steel safe ends were stress relieved. There is no use of alloy 82/182/600 materials in the Turkey Point Units 3 and 4 pressurizers or connected steam piping. The scope of review for each unit included the pressurizer surge nozzle, spray nozzle, safety nozzles (3), relief nozzle, heater sleeves (78), instrument nozzles (9), and the connected steam piping.

**Turkey Point Response to NRC Requests 1(b), 1(c), 1(d) and 2:** As identified in the response to request 1(a), the Turkey Point Units 3 and 4 pressurizers and steam piping connections were fabricated with stainless steels materials without the use of alloy 82/182/600 materials. Therefore, these requests are not applicable to Turkey Point Units 3 and 4.

# ATTACHMENT 3

## Seabrook Station Response
## NRC Bulletin 2004-01

## NRC BULLETIN 2004-01: "INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED WATER REACTORS."

### Requested Information

On May 28, 2004, the Nuclear Regulatory Commission (NRC) issued Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized Water Reactors." The NRC requested that specific information be provided within 60 days of the date of the Bulletin. FPL Energy Seabrook, LLC (FPLE Seabrook) hereby responds to the 60-day information request set forth in the Bulletin with respect to Seabrook Station.

*NRC Request: All subject PWR addressees are requested to provide the following information within 60 days of the date of this bulletin.*

*NRC Request 1(a): A description of the pressurizer penetrations and steam space piping connections at your plant. At a minimum, this description should include materials of construction (e.g., stainless steel piping and/or weld metal, Alloy 600 piping/sleeves, Alloy 82/182 weld metal or buttering, etc.), joint design (e.g., partial penetration welds, full penetration welds, bolted connections, etc.), and, in the case of welded joints, whether or not the weld was stress-relieved prior to being put into service. Additional information relevant with respect to determining the susceptibility of your plant's pressurizer penetrations and steam space piping connections to PWSCC should also be included.*

**FPLE Seabrook Response to NRC Request 1(a):** The pressurizer penetrations/nozzles and steam space piping connections for Seabrook Station are identified in Table 1.

*NRC Request 1(b): A description of the inspection program for Alloy 82/182/600 pressurizer penetrations and steam space piping connections that has been implemented at your plant. The description should include when the inspections were performed; the areas, penetrations and steam space piping connections inspected; the extent (percentage) of coverage achieved for each location which was inspected; the inspection methods used; the process used to resolve any inspection findings; the quality of the documentation of the inspections (e.g., written report, video record, photographs); and, the basis for concluding that your plant satisfies applicable regulatory requirements related to the integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections were found, indicate what follow-up NDE was performed to characterize flaws in the leaking penetrations.*

**FPLE Seabrook Response to NRC Request 1(b):** Seabrook Station has performed the required surface and volumetric examinations on the spray, relief, and safety nozzles (3) per the schedule set forth in the ASME Section XI Code. These ASME Code required examinations included the weld and required volume to the maximum extent achievable.

Seabrook Station Pressurizer ASME ISI Program Examinations:

| Pressurizer Connection | Inspection Method | Inspection Year | Code Coverage | Inspection Results |
|---|---|---|---|---|
| Safety Nozzle (A) | Surface | 92 | 100% | Acceptable |
| Safety Nozzle (A) | Volumetric | 94 | 63% | Acceptable |
| Safety Nozzle (B) | Surface | 94 | 100% | Acceptable |
| Safety Nozzle (B) | Volumetric | 94 | 56% | Acceptable |
| Safety Nozzle (C) | Surface | 94 | 100% | Acceptable |
| Safety Nozzle (C) | Volumetric | 94 | 71% | Acceptable |
| Relief Nozzle | Surface | 94 | 100% | Acceptable |
| Relief Nozzle | Volumetric | 94 | 64% | Acceptable |
| Spray Nozzle | Surface | 92 | 100% | Acceptable |
| Spray Nozzle | Volumetric | 94 | 61% | Acceptable |

There has been no evidence of leakage, reportable or recordable flaws from these pressurizer examinations. All examinations have been performed in accordance with the ASME Section XI program since the beginning of plant operation including pre-service. The examinations have been documented in written reports.

**Basis for concluding that your plant will satisfy applicable regulatory requirements:** The basis for concluding that Seabrook Station pressurizer penetrations and connected steam piping satisfy applicable regulatory requirements related to the integrity is provided in Section 3, Regulatory Requirements, of MRP-48. Although the MRP-48 response was provided for the upper reactor vessel head alloy 600 penetrations (NRC Bulletin 2001-01), the materials are the same and the responses are applicable. In addition, qualified personnel perform all examinations of the pressurizer alloy 82/182/600 locations to written procedures. The Seabrook Station corrective action program will be used to disposition all findings of potential leakage.

***NRC Request 1(c):*** *A description of the Alloy 82/182/600 pressurizer penetration and steam space piping connection inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the areas, penetrations and steam space piping connections to be inspected; the extent (percentage) of coverage to be achieved for each location; inspection methods to be used; qualification standards for the inspection methods and personnel; the process used to resolve any inspection indications; the inspection documentation to be generated; and the basis for concluding that your plant will satisfy applicable regulatory requirements related to the structural and leakage integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections are found, indicate what follow-up NDE will be performed to characterize flaws in the leaking penetrations. Provide your plans for expansion of the scope of NDE to be performed if circumferential flaws are found in any portion of the leaking pressurizer penetrations or steam space piping connections.*

**FPLE Seabrook Response to NRC Request 1(c):** Seabrook Station will perform a 100% bare metal visual examination (VT-2) of all the alloy 82/182/600 pressurizer penetrations and butt welds identified in Table 1 in the Spring of 2005. These examinations were scheduled in response to an MRP recommendation (EPRI MRP Letter 2003-039) to address concerns with alloy 82/182/600 pressure boundary materials. This plan also addresses the scope of this Bulletin. The examination area will include 100% of the weld surface. Personnel will be VT-2 qualified.

Subsequent bare metal VT-2 examinations of the alloy 182 spray, safety, and relief nozzle butt welds will follow a frequency to be identified by the ASME Code, EPRI MRP or regulatory action.

**Basis for concluding that your plant will satisfy applicable regulatory requirements:** See the response to request 1(b) above.

**Flaw characterization and NDE flaw expansion:** In the event that leakage is identified from an alloy 82/182/600 pressurizer penetration or piping connection, NDE will be performed to determine the orientation of the flaw. The NDE method will be chosen based on the joint configuration containing the flaw.

**Process used to resolve the source of findings:** FPLE will utilize the corrective action process to evaluate all findings of leakage during the pressurizer examinations outlined above. The process will include evaluations to determine if the findings of leakage are relevant or non-relevant as an RCS leak and to identify the source of the leakage.

If the NDE of these alloy 82/182/600 materials defines a flaw as potential circumferential cracking, the NRC will be notified and an appropriate inspection plan developed. The plan will define the expansion of NDE sufficient to determine the extent of condition commensurate with the characterization of the flaw.

***NRC Request 1(d):*** *In light of the information discussed in this bulletin and your understanding of the relevance of recent industry operating experience to your facility, explain why the inspection program identified in your response to item (1)(c) above is adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.*

**FPLE Seabrook Response to NRC Request 1(d):** The recent alloy 82/182/600 pressurizer operating experience (OE) sited in the NRC Bulletin has been considered and an appropriate initial inspection program has been developed based on the MRP recommendation letter to address concerns with alloy 82/182/600 pressure boundary materials. As identified above, Seabrook Station is committed to performing the inspections identified in the MRP document. The bare metal visual inspections combined with the periodic ASME Section XI examinations will provide an adequate indication that the integrity of the alloy 82/182/600 pressurizer penetrations and connected piping/welds are maintained.

*NRC Request 2. Within 60 days of plant restart following the next inspection of the Alloy 82/182/600 pressurizer penetrations and steam space piping connections, the subject PWR licensees should either:*

*(a) submit to the NRC a statement indicating that the inspections described in the licensee's response to item (1)(c) of this bulletin were completed and a description of the as-found condition of the pressurizer shell, any findings of relevant indications of through-wall leakage, follow-up NDE performed to characterize flaws in leaking penetrations or steam space piping connections, a summary of all relevant indications found by NDE, a summary of the disposition of any findings of boric acid, and any corrective actions taken and/or repairs made as a result of the indications found, or*

*(b) if the licensee was unable to complete the inspections described in response to item (1)(c) of this bulletin, submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the pressurizer shell, any findings of relevant indications of through-wall leakage, follow-up NDE performed to characterize flaws in leaking penetrations or steam space piping connections, a summary of all relevant indications found by NDE, a summary of the disposition of any findings of boric acid, and any corrective actions taken and/or repairs made as a result of the indications found. In addition, supplement the answer which you provided to item (1)(d) above to explain why the inspections that you completed were adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.*

**FPLE Seabrook Response to NRC Request 2:** FPLE will provide the requested information within 60 days after plant restart following the next examination at Seabrook Station.

**Table 1: SEABROOK STATION PRESSURIZER PENETRATION AND STEAM SPACE PIPING MATERIALS AND DESIGN DETAILS**

| Pressurizer Penetration/Piping Component | Qty | Material Type | Weld Joint Design | Size (Inches) |
|---|---|---|---|---|
| Spray Nozzle Assembly Consisting of: | 1 | | | 3.438" ID |
| Spray Nozzle (Integral) | 1 | Carbon/Alloy Steel | Material | |
| Spray Nozzle Bore Cladding (Tube) | 1 | Stainless Steel | Material | |
| Spray Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering weld | |
| Spray Nozzle Bore Tube to Buttering weld | 1 | Alloy 82 weld | Full Pen Butt Joint | |
| Spray Nozzle End Prep to Safe End Weld | 1 | Alloy 82/182 weld | Full Pen Butt Joint | |
| Spray Nozzle Safe End | 1 | Stainless Steel | Material | |
| Spray Nozzle Safe End to Spray pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Spray Pipe | 1 | Stainless Steel | Material | |
| Relief Nozzle Assembly Consisting of: | 1 | | | 5.187" ID |
| Relief Nozzle (Integral) | 1 | Carbon/Alloy Steel | Material | |
| Relief Nozzle (Integral) Clad | 1 | Stainless Steel | Clad Weld | |
| Relief Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering weld | |
| Relief Nozzle End Prep to Safe End Weld | 1 | Alloy 82/182 weld | Full Pen Butt Joint | |
| Relief Nozzle Safe End | 1 | Stainless Steel | Material | |
| Relief Nozzle Safe End to Relief Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Relief Pipe | 1 | Stainless Steel | Material | |
| Safety Valve Nozzle Assembly Consisting of: | 3 | | | 5.187" ID |
| Safety Valve Nozzle (Integral) | 3 | Carbon/Alloy Steel | Material | |
| Safety Valve Nozzle (Integral) Clad | 3 | Stainless Steel | Clad Weld | |
| Safety Valve Nozzle Weld End Prep Buildup (butter) | 3 | Alloy 182 weld | Buttering weld | |
| Safety Valve Nozzle End Prep to Safe End Weld | 3 | Alloy 82/182 weld | Full Pen Butt Joint | |
| Safety Valve Nozzle Safe End | 3 | Stainless Steel | Material | |
| Safety Valve Nozzle Safe End to Safety Valve Pipe Weld | 3 | Stainless Steel | Full Pen Butt Joint | |
| Safety Valve Pipe | 3 | Stainless Steel | Material | |
| Surge Nozzle Assembly Consisting of: | 1 | | | 14.00" OD |
| Surge Nozzle (Integral) | 1 | Carbon/Alloy Steel | Material | |
| Surge Nozzle (Integral) Clad | 1 | Stainless Steel | Clad Weld | |
| Surge Nozzle Thermal Sleeve | 1 | Stainless Steel | Material | |
| Surge Nozzle Weld End Prep Buildup (butter) | 1 | Alloy 182 weld | Buttering weld | |
| Surge Nozzle Thermal Sleeve to build-up weld | 1 | Alloy 82 weld | Full Pen Butt Joint | |
| Surge Nozzle End Prep to Safe End Weld | 1 | Alloy 82/182 weld | Full Pen Butt Joint | |
| Surge Nozzle Safe End | 1 | Stainless Steel | Material | |
| Surge Nozzle Safe End to Surge Pipe Weld | 1 | Stainless Steel | Full Pen Butt Joint | |
| Steam Space Level/Pressure Instrument Nozzles Consisting of: | 4 | | | |
| Instrument Nozzles | 4 | Stainless Steel | Material | |
| Instrument Nozzle to Pressurizer Vessel Cladding Weld | 4 | Stainless Steel | Internal Partial Pen J-groove | |
| Instrument Nozzle Coupling | 4 | Stainless Steel | Material | |
| Instrument Nozzle to Piping Welds | 4 | Stainless Steel | Socket Welds | |
| Instrument Nozzle Piping | 4 | Stainless Steel | Material | 0. 612" ID |
| Water Space Level & Temperature Instrument Nozzles Consisting of: | 5 | | | |
| Instrument Nozzles | 5 | Stainless Steel | Material | |
| Instrument Nozzle to Pressurizer Vessel Cladding Weld | 5 | Stainless Steel | Internal Partial Pen J-groove | |

**Table 1: SEABROOK STATION PRESSURIZER PENETRATION AND STEAM SPACE PIPING MATERIALS AND DESIGN DETAILS**

| Pressurizer Penetration/Piping Component | Qty | Material Type | Weld Joint Design | Size (Inches |
|---|---|---|---|---|
| Instrument Nozzle Coupling | 5 | Stainless Steel | Material | |
| Instrument Nozzle to Piping Weld | 5 | Stainless Steel | Socket Weld | |
| Instrument Nozzle Piping | 5 | Stainless Steel | Material | 0.612" ID |
| Heater Well | 78 | Stainless Steel | Material | 0.875" ID |
| Heater Well to Pressurizer Vessel cladding weld | 78 | Stainless Steel | Internal Partial Pen J-groove | |

The final alloy 82/182 welds were not stress relieved prior to being put into service. The alloy 82/182 end prep buttering on the spray, relief, safety and surge nozzles were stress relieved prior to the safe end weld being completed.