Florida Power & Light Company, P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

SEP 19 2003

L-2003-234
10 CFR 50.54(f)

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 2003-02
Leakage From Reactor Pressure Vessel Lower Head Penetrations
And Reactor Coolant Pressure Boundary Integrity

On August 21, 2003, the NRC issued Bulletin (NRCB) 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." 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 entering refueling outages before December 31, 2003 were requested to respond within 30 days of the date of this bulletin. Note, both Turkey Point Unit 4 and Seabrook Station have fall 2003 refueling outages. Attachment 1 provides the FPL Turkey Point Unit 3 and Unit 4 response. Attachment 2 provides the FPL Energy Seabrook response. NRCB 2003-02 is not applicable to St. Lucie Unit 1 and Unit 2 since they do not have penetrations in the lower head of the reactor pressure vessel.

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 us if you have any additional questions regarding these responses.

Sincerely yours,

Rajiv S. Kundalkar

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

Attachments (2)

A109

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.

R. S. Kundalkar

Subscribed and sworn to before me this

19 day of September, 2003,

Roberta S. Economy

Name of Notary Public (Type or Print)

Roberta S. Economy
MY COMMISSION # DD007295 EXPIRES
June 1, 2005
BONDED THRU TROY FAIN INSURANCE, INC.

R. S. Kundalkar is personally known to me.

ATTACHMENT 1

Turkey Point Plant Units 3 and 4 Response
NRC Bulletin 2003-02

Requested Information

NRC BULLETIN 2003-02: "LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY," RESPONSE FOR TURKEY POINT UNITS 3 AND 4

On August 21, 2003, the Nuclear Regulatory Commission (NRC) issued Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The NRC requested that specific information be provided within 30 days of the date of the Bulletin. Florida Power and Light Company (FPL) hereby responds to the 30-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. The responses for facilities that will enter refueling outages before December 31, 2003, should be provided within 30 days of the date of this bulletin. All other responses should be provided within 90 days of the date of this bulletin.*

NRC Request 1(a): *A description of the RPV lower head penetration inspection program that has been implemented at your plant. The description should include when the inspections were performed, the extent of the inspections with respect to the areas and penetrations inspected, inspection methods used, the process used to resolve the source of findings of any boric acid deposits, 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 the RPV lower head penetrations.*

FPL Response to Request 1(a): As identified in the response to Question 5 [1] of the NRC request for additional information on boric acid inspection programs, previous inspections of the bottom mounted instrumentation penetrations (BMIs) at Turkey Point Units 3 and 4 have been performed as part of the ASME Section XI system leakage test walkdown performed at every (18 month) refueling outage (RFO) with the system at normal operating pressure and the insulation in place. These walkdown inspections are performed by procedure and documented on a system pressure test report in accordance with our ASME Section XI program. Although past procedures did not specifically identify the BMI nozzles, the system

[1] FPL letter L-2003-007, "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 2002-01, Request for Additional Information Response " J. A. Stall to NRC, January 31, 2003.

pressure tests and boric acid program walkdowns have never identified any BMI leakage. However, minor discoloration was noted at the last Turkey Point Unit 3 RFO that was dispositioned as cavity seal ring leakage as discussed below:

During the Turkey Point Unit 3 spring 2003 RFO, the leak inspection walkdown of the BMIs revealed a minor discoloration on BMI # 35. A condition report was written as required by our corrective action program. As part of the disposition, insulation cover plates were removed around BMI penetration # 35 to reveal the interface where the nozzle enters the reactor vessel lower head. A direct visual examination was performed by a qualified VT-2 examiner and documented as part of the corrective action program. Digital images of the examination area were also recorded as shown in the figure below. The stain on both the nozzle and the RV surface was described as a dry rust film of no discernible thickness. The stain trail was observed coming from above this outer periphery nozzle (#35) on the vessel surface. No white boron deposits or accumulation was noted on the vessel surface or around the circumference of the nozzle as it penetrated the RV surface (see figure below). The source of the rust stain on the RV lower head surface and BMI penetration #35 was determined to be coming from above, most likely cavity seal ring leakage during refueling and not relevant as a BMI leak since there is no heat source to concentrate boric acid. Similar staining was also noted on the RV cavity walls below the refueling cavity seal ring. A smear sample was taken of the rust stain to analyze the activation products to determine the age of the stain/leak source. However, due to the stain having no discernable thickness (small sample size) the results were inconclusive.

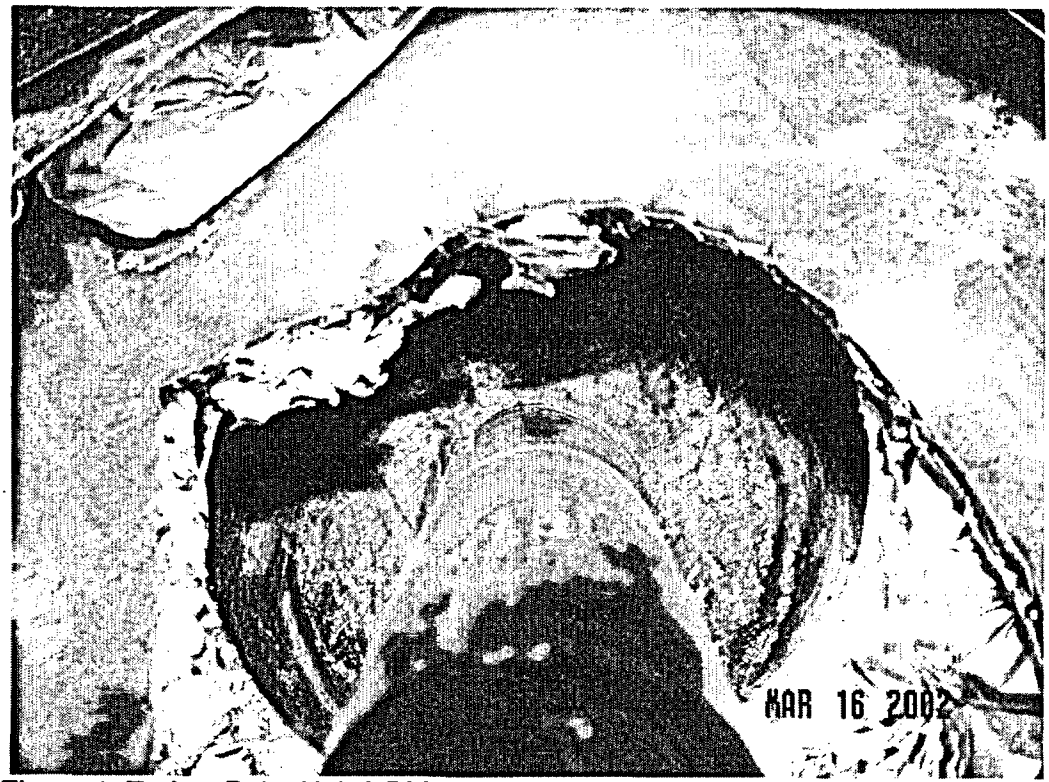

Figure 1: Turkey Point Unit 3 BMI penetration # 35 at the vessel interface during 2003 RFO. Note clean insulation surrounding the penetration and no boron deposits or accumulation.

The basis for concluding that Turkey Point Units 3 and 4 satisfy applicable regulatory requirements related to the integrity of the RPV lower head penetrations is provided in Section 3, Regulatory Requirements, of MRP-48 [2] that was provided for the upper head reactor vessel head alloy 600 penetrations (NRC Bulletin 2001-01). A plant specific discussion for the regulations applicable to the Turkey Point Unit 3 and 4 license was provided in the FPL response to NRC Bulletin 2001-01.[3] The reactor vessel BMIs were designed using the same alloy 600 material as the upper head penetrations except that the lower head BMI penetrations utilize a clearance fit which would make detection of leakage more likely to be detected at the early stages. As a result of the recent BMI operating experience (OE) identified at South Texas Project Unit 1 (STP-1) and the EPRI Material Reliability Program (MRP) recommendations, FPL will be conducting visual examinations as identified in the response below.

The "Applicable Regulatory Requirements" section of NRCB 2003-02 list specific General Design Criteria (GDC) of 10 CFR 50 Appendix A applicable to the lower head penetration nozzle cracking issue. The GDCs identified include GDC 14, GDC 31, and GDC 32. Turkey Point Units 3 and 4 are committed to the 1967 Proposed General Design Criteria as specifically addressed in various sections of the Turkey Point UFSAR. The 1967 Proposed General Design Criteria 9, 34, and 36 contain requirements for reactor coolant pressure boundary, reactor coolant pressure boundary rapid propagation failure prevention and reactor coolant pressure boundary surveillance requirements similar to the current requirements in GDC 14, 31, and 32. Regardless, the requirements established for design, fracture toughness, and inspectability were satisfied during Turkey Point Units 3 and 4 initial licensing review, and will continue to be satisfied during operation by performance of the visual inspections identified in this response.

NRC Request 1(b): *A description of the RPV lower head penetration inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the extent of the inspections which will be conducted with respect to the areas and penetrations to be inspected, inspection methods to be used, qualification standards for the inspection methods, the process used to resolve the source of findings of boric acid deposits or corrosion, 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 the RPV lower head penetrations.*

FPL Response to NRC Request 1(b):

Extent of the Inspections: The visual examination scope for Turkey Point Unit 4 RFO (fall 2003) is planned to include all 50 BMI penetrations, including 100% of the circumference of each penetration as it enters the RV lower head. Existing holes in the insulation will be mechanically enlarged, as needed to provide access to the bare metal around each BMI penetration. This bare metal examination is a first of a kind examination in this high dose

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

[3] FPL letter L-2001-198, "St. Lucie Units 1 and 2 and Turkey Point Units 3 and 4, Docket Nos. 50-335, 50-389, 50-250 and 50-251, Response to NRC Bulletin 2001-01, " R. S. Kundalkar to NRC, September 4, 2001.

area for Turkey Point. The examination will be performed to the maximum extent practical in order to obtain a 100% exam. However, the examination scope may be reduced in the event that the access to some penetrations can not be achieved without the implementation of additional unplanned plant modifications, and results for the areas examined indicate that no BMI penetrations are leaking. During this examination, detailed walkdowns will be performed to prepare for an insulation design modification at the subsequent RFO that will support a complete examination.

The visual examination scope for the Turkey Point Unit 3 RFO (fall 2004) is planned to include all 50 BMI penetrations including 100% of the circumference of each penetration as it enters the RV lower head to the maximum extent practical as identified above. Depending on the success of the approach for the fall 2003 Turkey Point Unit 4 examination, access to the bare metal around the BMI penetrations will be accomplished by either expanding the insulation holes, modifying the insulation, or lowering the insulation, as needed.

The examination scope for subsequent RFOs, when performed, will include all 50 BMI penetrations including 100% of the circumference of each penetration as it enters the RV lower head. Modifications will be implemented at these outages as necessary to complete a 100% direct visual examination of the BMIs. The boric acid inspection program will be modified to include VT-2 bare metal examination of the BMIs at a frequency determined by the EPRI Material Reliability Program, ASME Code changes, or Regulatory action.

Inspection methods: The (VT-2) examination method for the BMI at both Turkey Point Units 3 and 4 will use remote borescopic probes or direct visual methods.

Qualification standards: The visual examination personnel and procedures will be qualified in accordance with the vendor's written practice and ASME Section XI. The examination will be supplemented by the guidance provided by the March 2002 EPRI report,[4] as applicable for the lower head penetrations.

Personnel utilized to perform these supplemental examinations will be certified in accordance with the vendor's written practices. FPL will review and approve all NDE personal certifications and procedures prior to examinations being performed.

Process used to resolve the source of findings: FPL will utilize the condition report process to evaluate all findings of leakage during the BMI penetration examination. 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. Examples of the characteristics associated with relevant leakage are identified in the March 2002 EPRI report[4]. This information will be supplemented by the as found pictures of the boric acid accumulation at South Texas Project Unit 1 (STP-1) BMI locations #1 and #46, available on the NRC web site. Unlike the reactor vessel head upper penetrations, the bottom head

[4] "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV head: Revision 1 of 1006296, Includes Fall 2001 Results," EPRI, Palo Alto, CA: March 2002, 1006899.

location has no other potential leak source location during normal plant operation that could result in boron accumulation. Cavity seal ring leakage, that occurs during a refueling outage, only occurs at low temperature and results in staining without "popcorn like" accumulation features of an RCS leak at normal operating temperature. The lower head location of the BMI penetrations is also not likely to be affected by settled debris that could mask a VT-2 examination. Tools to evaluate relevant indications of leakage (boron accumulation) would include sample collection for chemical and isotopic analysis.

Examples of non-relevant leakage may include thin films or stains of boron or light surface rust having a characteristic of no discernable thickness and no accumulation around the penetration. Non relevant indications would typically have a trail leading to the source which is away from the BMI penetration. Each case of leakage will be documented using the corrective action process. The determination of whether the finding is relevant or non-relevant to leakage from a BMI nozzle will be documented. Thin film boron stains or light rust films will not be chemically or isotopically analyzed since they do not provide sufficient accumulation for a sample.

Documentation of the Inspections: The examinations will be documented in a report signed by the qualified VT-2 examiner that performed the examination. Video and photographic images to support the examination findings will supplement the report if necessary.

Basis for concluding that your plant will satisfy applicable regulatory requirements: The technical basis for concluding that the regulatory bases are met for Turkey Point Units 3 and 4 is provided in the response to question 1(a) above. As a result of the recent BMI operating experience (OE) identified at South Texas Project Unit 1 (STP-1) and the EPRI Material Reliability Program (MRP) recommendations, FPL will be conducting visual examinations as identified in the responses above. Furthermore, the robust design, choice of a material with extremely high flaw tolerance and effective visual examinations will assure that the integrity of the reactor vessel will be maintained.

NRC Request 1(c): *If you are unable to perform a bare-metal visual inspection of each penetration during the next refueling outage because of the inability to perform the necessary planning, engineering, procurement of materials, and implementation, are you planning to perform bare-metal visual inspections during subsequent refueling outages? If so, provide a description of the actions that are planned to enable a bare-metal visual inspection of each penetration during subsequent refueling outages. Also, provide a description of any penetration inspections you plan to perform during the next refueling outage. The description should address the applicable items in paragraph (b).*

FPL Response to NRC Request 1(c): As stated in the response to 1(b) above, FPL is planning to modify the reactor vessel lower head insulation design, as necessary, to accommodate a complete bare metal examination of all 50 BMI penetrations for subsequent RFOs.

NRC Request 1(d): *If you do not plan to perform either a bare-metal visual inspection or non-visual (e.g., volumetric or surface) examination of the RPV lower head penetrations at the next or subsequent refueling outages, provide the basis for concluding that the inspections performed will assure applicable regulatory requirements are and will continue to be met.*

FPL Response to NRC Request 1(d): FPL is planning bare metal visual inspections of the bottom heads at Turkey Point Units 3 and 4 as described above.

NRC Request 2. *Within 60 days of plant restart following the next inspection of the RPV lower head penetrations, the subject PWR addressees should 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 lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found.*

FPL Response to NRC Request 2:

FPL will provide this request within 60 days after plant restart following the next inspection at Turkey Point Units 3 and 4.

ATTACHMENT 2

Seabrook Station Response
NRC Bulletin 2003-02

Requested Information

NRC BULLETIN 2003-02: "LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY," RESPONSE FOR SEABROOK STATION

On August 21, 2003, the Nuclear Regulatory Commission (NRC) issued Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity." The NRC requested that specific information be provided within 30 days of the date of the Bulletin. FPL Energy Seabrook, LLC (FPLE Seabrook) hereby responds to the 30-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. The responses for facilities that will enter refueling outages before December 31, 2003, should be provided within 30 days of the date of this bulletin. All other responses should be provided within 90 days of the date of this bulletin.*

NRC Request 1(a): *A description of the RPV lower head penetration inspection program that has been implemented at your plant. The description should include when the inspections were performed, the extent of the inspections with respect to the areas and penetrations inspected, inspection methods used, the process used to resolve the source of findings of any boric acid deposits, 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 the RPV lower head penetrations.*

FPLE Seabrook Response to Request 1(a): Previous inspections of the bottom mounted instrumentation penetrations (BMIs) at Seabrook Station have been performed as part of the ASME Section XI system leakage test walkdown performed at every (18 month) refueling outage (RFO) with the system at normal operating pressure and the insulation in place. These VT-2 inspections are performed by procedure, looking for evidence of leakage on the insulation and the floor, and documented on a system pressure test report in accordance with our ASME Section XI program. The system pressure tests have not identified any BMI leakage to date.

The basis for concluding that Seabrook Station satisfies applicable regulatory requirements related to the integrity of the RPV lower head penetrations is provided in Section 3, Regulatory Requirements, of MRP-48 that was provided for the reactor vessel upper head

alloy 600 penetrations (NRC Bulletin 2001-01). A plant specific discussion for the regulations applicable to the Seabrook Station license was provided in the response to NRC Bulletin 2001-01. The reactor vessel BMIs and upper head penetrations are fabricated from Alloy 600 material.

The previous examinations have met the requirements of Section XI of the ASME Code using certified VT-2 examination personnel identified in accordance with plant procedures.

As a result of the recent BMI operating experience (OE) identified at South Texas Project Unit 1 (STP-1) and the EPRI Material Reliability Program (MRP) recommendations (MRP 2003-17, Letter Dated June 2003), FPLE Seabrook will be conducting visual examinations as identified in the response below.

NRC Request 1(b): *A description of the RPV lower head penetration inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the extent of the inspections which will be conducted with respect to the areas and penetrations to be inspected, inspection methods to be used, qualification standards for the inspection methods, the process used to resolve the source of findings of boric acid deposits or corrosion, 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 the RPV lower head penetrations.*

FPLE Seabrook Response to NRC Request 1(b):

Extent of the Inspections: Seabrook Station's next refueling outage (OR09) is scheduled for October 4, 2003. The visual examination scope for this refueling outage is planned to include all 58 BMI penetrations including 100% of the circumference of each penetration as it enters the RV lower head. This bare metal examination is a first of a kind examination in this high dose area for Seabrook Station. The examination will be performed to the maximum extent practical in order to obtain a 100% exam. However, the examination scope may be reduced in the event that the access to some penetrations can not be achieved without the implementation of additional unplanned modifications and results for the areas examined indicate that no BMI penetrations are identified to be leaking. If necessary, during this examination, detailed walkdowns will be performed to prepare for any plant design modification or inspection technology at the subsequent RFO that will support a complete examination.

The examination scope for subsequent RFOs, when performed, will include all 58 BMI penetrations including 100% of the circumference of each penetration as it enters the RV lower head. The boric acid inspection program will be modified to include VT-2 bare metal examination of the BMIs at a frequency determined by the EPRI Material Reliability Program, ASME Code Changes or Regulatory action.

Inspection methods: The examination method for the BMIs at Seabrook Station will be direct visual supplemented with remote methods as necessary.

Qualification standards: The visual examination personnel will be qualified in accordance with the site written practice. The complete inspection process will be qualified to comply with the intent of ASME Section XI. The examination will be supplemented with the guidance provided in the March 2002 EPRI report, as applicable to lower head penetrations. The as found pictures of the boric acid accumulation at South Texas Project Unit 1 (STP-1) at BMI locations #1 and #46, are also part of the orientation of the inspection personnel.

Process used to resolve the source of findings: FPLE Seabrook will utilize the Condition Report (CR) process to evaluate all findings of leakage during the BMI penetration examination. 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. Examples of the characteristics associated with relevant leakage are identified in the March 2002 EPRI report. This information will be supplemented by the as found pictures of the boric acid accumulation at South Texas Project Unit 1 (STP-1) at BMI locations #1 and #46, available on the NRC web site. Unlike the reactor vessel upper head penetrations, the bottom head location has no other potential leak source location during normal plant operation that could result in boron accumulation. Cavity seal ring leakage, that occurs during a refueling outage, only occurs at low temperature and results in staining without "popcorn like" accumulation features of an RCS leak at normal operating temperature. The lower head location of the BMI penetrations is also not likely to be affected by settled debris that could mask a VT-2 examination. Tools to evaluate relevant indications of leakage (boron accumulation) would include sample collection for chemical and isotopic analysis.

Examples of non-relevant leakage may include thin films or stains of boron or light surface rust having a characteristic of no discernable thickness with little or no accumulation around the penetration. Non relevant indications would typically have a trail leading to the source which is away from the BMI penetration. Each case of leakage will be documented using the condition report process. The determination of whether the finding is relevant or non-relevant to leakage from a BMI nozzle will be documented. Thin film boron stains or light rust films may not be chemically or isotopically analyzed since they do not provide sufficient accumulation for a sample.

Documentation of the inspections: The examinations will be documented in a report signed by the qualified VT-2 examiner that performed the examination. Video and photographic images to support the CR process will supplement the report if necessary.

Basis for concluding that your plant will satisfy applicable regulatory requirements: The technical basis for concluding that the regulatory bases are met for Seabrook Station is provided in the response to question 1(a) above. As a result of the recent BMI operating experience (OE) identified at South Texas Project Unit 1 (STP-1) and the EPRI Material Reliability Program (MRP) recommendations provided in the June 2003 letter, FPLE Seabrook will be conducting visual examinations as identified in the responses above. The design, use of a material with extremely high flaw tolerance and more effective bare metal visual examinations will assure that the integrity of the reactor vessel will be maintained.

NRC Request 1(c): *If you are unable to perform a bare-metal visual inspection of each penetration during the next refueling outage because of the inability to perform the necessary planning, engineering, procurement of materials, and implementation, are you planning to perform bare-metal visual inspections during subsequent refueling outages? If so, provide a description of the actions that are planned to enable a bare-metal visual inspection of each penetration during subsequent refueling outages. Also, provide a description of any penetration inspections you plan to perform during the next refueling outage. The description should address the applicable items in paragraph (b).*

FPLE Seabrook Response to NRC Request 1(c): As stated in the response to 1(b) above, FPLE Seabrook will perform detailed walkdowns to prepare for any plant design modification or inspection technology at the subsequent RFO that will ensure a complete bare metal examination of all 58 BMI penetrations.

NRC Request 1(d): *If you do not plan to perform either a bare-metal visual inspection or non-visual (e.g., volumetric or surface) examination of the RPV lower head penetrations at the next or subsequent refueling outages, provide the basis for concluding that the inspections performed will assure applicable regulatory requirements are and will continue to be met.*

FPLE Seabrook Response to NRC Request 1(d): FPLE Seabrook is planning bare metal visual inspections at Seabrook Station as described above.

NRC Request 2. *Within 60 days of plant restart following the next inspection of the RPV lower head penetrations, the subject PWR addressees should 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 lower head, any findings of relevant indications of through-wall leakage, and a summary of the disposition of any findings of boric acid deposits and any corrective actions taken as a result of indications found.*

FPLE Response to NRC Request 2: FPLE Seabrook will provide a summary of the inspections within 60 days after plant restart following OR09 at Seabrook Station.