NEXTera ENERGY POINT BEACH

February 19, 2010

NRC 2010-0027
GL 2004-02

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

Point Beach Nuclear Plant, Units 1 and 2
Dockets 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

Request for Extension of Completion Date for Generic Letter 2004-02, Potential Impact for Debris Blockage in Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors (TAC No. MC4705/MC4706)

References (1) NextEra Energy Point Beach, LLC, Letter to NRC, dated June 12, 2009, Request for Extension of Unit 1 and 2 Completion Dates for Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors (TAC Nos. MC4705/4706) (ML091660326)

(2) NRC Letter to NextEra Energy Point Beach, LLC, dated June 30, 2009, Point Beach Nuclear Plant, Units 1 and 2, GSI-191/GL 2004-02, Additional Extension Request Approval (TAC Nos. MC4705 and MC4706) (ML091800430)

On February 18, 2010, a telephone conference was held between representatives of NextEra Energy Point Beach, LLC (NextEra) and the NRC staff to discuss a request for an extension to achieve compliance with the provisions of GSI-191/GL 2004-02 at Point Beach Nuclear Plant (PBNP), Units 1 and 2.

NextEra previously requested an extension to achieve compliance by June 30, 2010, for Unit 1, and by June 30, 2011, for PBNP Unit 2 (Reference 1). An extension was granted by the Commission until June 30, 2010, for PBNP Unit 1 and to June 30, 2011, for PBNP Unit 2 via Reference 2.

NextEra remains committed to reduce the amount of fibrous insulation inside the PBNP containments. Completion of the insulation reduction effort will result in final plant configurations that will be in compliance with the provisions of GSI-191/GL 2004-02.

During the planning phase for work to be performed in Unit 1 and as a result of lessons learned during the fall 2009 Unit 2 fibrous insulation replacement activity, NextEra determined that significant dose will be expended to replace the insulation. NextEra has evaluated the replacement scope and the options to reduce the dose and concluded that dose reductions can be achieved with further chemistry control, additional ALARA planning and/or plant improvements.

Additionally, there are unresolved generic industry issues that could impact the final debris load. As such, NextEra proposes to replace a portion of the insulation in the spring 2010 refueling outage, implement actions to reduce exposure and gather information to allow for more detailed ALARA planning, and complete insulation removal and all corrective actions by the spring 2013 outage for Unit 1. NextEra also plans to factor these lessons learned into continued activities planned over the next two outages on Unit 2. The proposed schedule would be consistent with other expected time frames for insulation replacement in the industry.

Enclosure 1 provides a description of the fiber reduction effort , the basis for the proposed extension request, and a revised milestone schedule. NextEra requests approval of the extension request by March 21, 2010.

Summary of Regulatory Commitments

The following Regulatory Commitment was made by NextEra in Reference (1):

> FPL Energy Point Beach will complete actions to resolve GSI-191 at PBNP by June 30, 2010, for Unit 1, and by December 31, 2011, for Unit 2.

The Regulatory Commitment is revised as follows:

> NextEra Energy Point Beach will complete actions to resolve GSI-191 at PBNP by June 30, 2013, for Unit 1, and by December 31, 2012, for Unit 2.

If you have questions or require additional information, please contact Mr. James Costedio at 920/755-7427.

In accordance with the provisions of 10 CFR 50.91, a copy of this submittal has been provided to the designated Wisconsin Official.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 19, 2010.

Very truly yours,

NextEra Energy Point Beach, LLC

Larry Meyer
Site Vice President

Enclosure

cc: USNRC Resident Inspector, Point Beach Nuclear Plant
USNRC Project Manager, Point Beach Nuclear Plant
Administrator, USNRC Region III
PSCW

ENCLOSURE 1

NEXTERA ENERGY POINT BEACH LLC
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

REQUEST FOR EXTENSION FOR COMPLETION DATE
GENERIC LETTER 2004-02

POTENTIAL IMPACT FOR DEBRIS BLOCKAGE IN EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESURIZED WATER REACTORS (TAC NOS. MC4705/4706)

1.0 Background

On September 13, 2004, the NRC issued NRC Generic Letter (GL) 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors (ML042360586). The generic letter requested licensees to take the following actions:

> Using an NRC-approved methodology, perform a mechanistic evaluation of the potential for the adverse effects of post-accident debris blockage and operation with debris-laden fluids to impede or prevent the recirculation functions of the emergency core cooling system (ECCS) and containment spray system (CSS) following all postulated accidents for which the recirculation of these systems is required.
>
> Implement any plant modifications that the above evaluation identifies as being necessary to ensure system functionality.

Nuclear Management Company, LLC (NMC), the former license holder for Point Beach Nuclear Plant (PBNP) Units 1 and 2, responded to GL 2004-02 via letters dated September 1, 2005 (ML052500302), April 28, 2006, (ML061210032) and October 3, 2006 (ML062850105). NMC also responded to NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors - 60-Day Response, via letter dated August 8, 2003 (ML032310423).

Following the sale of PBNP Units 1 and 2 on September 28, 2007, FPL Energy Point Beach responded to GL 2004-02 on November 16, 2007 (ML073230345), and February 29, 2008 (ML080630613).

By letter dated November 16, 2007 (ML073230345), FPL Energy Point Beach requested an extension of the December 31, 2007, completion date for compliance with GL 2004-02. By letter dated December 20, 2007 (ML073511698), the NRC granted an extension until June 30, 2008.

By letter dated June 9, 2008 (ML081620337), supplemented by a letter dated June 23, 2008 (ML081760129), FPL Energy Point Beach requested an extension of the June 30, 2008, completion date for GL 2004-02, to September 30, 2008. In the June 9, 2008, letter, FPL Energy Point Beach reported replacement of the sump screens in PBNP Units 1 and 2, and revision of the affected plant procedures to reflect the operating requirements of the new screens. These modifications represented a significant improvement of the previous design by

providing increased strainer surface areas, increased net positive suction head (NPSH) margin and reduced downstream effects. By letter dated July 1, 2008, the Commission granted an extension of the completion date for PBNP Units 1 and 2 to September 30, 2008 (ML081790538).

On September 8, 2008 (ML082530196), FPL Energy Point Beach requested an extension of the September 30, 2008, completion date to June 30, 2009, for PBNP Unit 1, and to December 21, 2009, for Unit 2 to permit installation of additional strainer modules.

In PBNP Unit 1, approximately 400 ft^2 of strainer surface area has been added to each train and the strainer assemblies have been structurally reinforced to accommodate a greater differential pressure. Similar modifications were performed in PBNP Unit 2 during its fall 2009 refueling outage.

By letter dated October 6, 2008 (ML082740151), the NRC granted an extension for Unit 1 until June 30, 2009, for completion of strainer chemical effects testing and in-vessel and ex-vessel downstream effects evaluations. In that letter, the staff stated that for PBNP Unit 2, the extension to December 21, 2009, is intended to be an interim extension period to allow the NRC staff time to determine if there is the need for additional regulatory action.

On June 12, 2009, NextEra requested an extension to achieve compliance by June 30, 2010, for PBNP Unit 1, and by June 30, 2011, for PBNP Unit 2 (Reference 1) to permit reduction in the amount of fibrous insulation. By letter dated June 30, 2009 (Reference 2), an extension was granted by the Commission until June 30, 2010, for PBNP Unit 1 and to June 30, 2011, for PBNP Unit 2.

2.0 Reason for the Request for Extension

NextEra has initiated actions to significantly reduce the amount of fibrous insulation in PBNP Units 1 and 2 to achieve a calculated fiber load on the containment sump strainers that is bounded by the results of previously completed tests. During the planning phase for the Unit 1 outage and as a result of lessons learned during the fall 2009 Unit 2 fibrous insulation replacement activities, NextEra determined that significant dose will be expended to replace the insulation on both units. NextEra determined that the Unit 1 insulation removal and replacement scope described in Reference 1 will result in a dose of approximately 100 Rem. NextEra has evaluated the replacement scope and the options to reduce the dose and concluded that dose reductions can be achieved with further chemistry control, additional ALARA planning and/or plant improvements. However, based on industry experience, the benefits of a dose reduction plan may take several cycles to realize.

In addition to the dose concern discussed above, there are unresolved generic industry issues that could expand the scope of insulation replacement. This additional impact must be evaluated and N-1 walkdowns performed in order to effectively plan this work. A number of the potentially affected lines are in areas that typically do not have work performed and as such, comprehensive survey and interference details are not available.

Based upon the above, NextEra plans to replace the insulation over the next several outages. For Unit 1, information is available for a portion of the insulation scope and therefore some insulation will be replaced in the spring 2010 refueling outage. Subsequent to the spring 2010 Unit 1 outage, two areas will be addressed. The first area is source term reduction. NextEra has completed an assessment and is evaluating actions to reduce the overall source term that could

be implemented subsequent to the spring 2010 outage. This source term reduction is expected to reduce the overall plant dose rates. The second area is to identify revisions to the replacement scope resulting from resolution of the generic industry issues currently being discussed. NextEra will determine if insulation scope expansion is required during the next operating cycle and will perform detailed planning walkdowns in the fall Unit 1 2011 outage. The remaining insulation replacement scope will be completed during the spring Unit 1 2013 outage. A similar path forward will be implemented for Unit 2 and is discussed in Section 3.1 below.

3.0 Technical Basis for Proposed Extension

NextEra considers that the conditions at PBNP continue to meet the criteria identified in SECY-06-0078, Status of Resolution of GSI-191, Assessment of [Effect of] Debris Accumulation on PWR Sump Performance (ML053620174), for extension beyond the completion date of December 31, 2007, that was specified in GL 2004-02. The SECY criteria are as follows:

Proposed extensions to permit changes at the next outage of opportunity after December 2007 may be acceptable if, based on the licensee's request, the staff determines that:

- *The licensee has a plant-specific technical/experimental plan with milestones and schedules to address the outstanding technical issues with enough margin to account for uncertainties.*

- *The licensee identifies mitigative measures to be put in place prior to December 31, 2007, and adequately describes how these mitigative measures will minimize the risk of degraded ECCS and CSS functions during the extension period.*

- *For proposed extension beyond several months, a licensee's request will more likely be accepted if the proposed mitigative measures include temporary physical improvements to the ECCS sump or materials inside containment to better ensure a high level of ECCS sump performance.*

These criteria are met as described below:

3.1 Plant-Specific Plan, Milestones and Schedule

During the Unit 1 fall 2008 outage and the Unit 2 fall 2009 outage, NextEra installed three (3) additional strainer modules on each train of existing strainers and structurally reinforced the strainer assemblies to accommodate an increased differential pressure. NextEra plans to reduce the fibrous insulation to ensure that the calculated fiber load on the strainer is in compliance with the requirements of GSI-191/GL 2004-02.

In order to be in compliance with ALARA practices while addressing outstanding generic industry issues, NextEra has concluded that a phased insulation replacement approach over several cycles provides the optimum solution. The general approach is described above. Each unit is addressed individually below.

Unit 1

Although much of the insulation in Unit 1 is already RMI, NextEra has committed to further reduce the fibrous insulation to ensure that the calculated fiber load on the strainer is acceptable. The affected components include the steam generator channel heads, pressurizer and reactor coolant pump bowls. Additionally, insulation on the applicable portions of the chemical and volume control system (CVCS) letdown line, pressurizer spray lines, resistance temperature detector (RTD) bypass lines, safety injection lines, and RHR suction line insulation will be replaced. As stated above, this is the currently identified insulation replacement scope and is based on fiberglass and asbestos zones of influence (ZOIs) of 17D.

During the spring 2010 Unit 1 refueling outage, NextEra plans to replace approximately one-third of the currently identified Unit 1 total insulation scope. The scale of the fiber reduction effort requires significant personnel and material resources to be applied in a relatively small area within the containment, resulting in adequate work space concerns. These concerns are further compounded by the handling and disposal practices associated with asbestos-laden insulation in accordance with OSHA and Clean Air Act requirements. Additionally, detailed planning walk downs will be performed to gather information on the known remaining scope of insulation replacement.

During the operating cycle subsequent to the spring 2010 outage, two specific areas will be addressed. The first area is source term reduction. NextEra has completed an assessment and is evaluating actions to reduce the overall dose rate which could be implemented before and subsequent to the spring 2010 outage. Items being evaluated include operation of both reactor coolant pumps during cool down to minimize corrosion product plate-out, maximizing purification flow rates, assuring that one reactor coolant pump remains in service until a predetermined RCS activity target is met, and the use of specialized resins to reduce coolant contamination. Based on industry experience, the benefits of a dose reduction plan may take several cycles to fully realize. Although results vary by station and data do not exist to specifically predict the dose reduction for PBNP, these strategies have been shown by industry experience to provide significant reductions in primary piping dose rates.

In addition to the dose concern discussed above, there are unresolved generic industry issues that could expand the scope of insulation replacement. The second area is to identify expansion of the replacement scope resulting from resolution of the generic industry issues. During the next operating cycle, NextEra will determine if insulation scope expansion is needed and to finalize the list of insulation requiring replacement.

During the fall 2011 refueling outage, NextEra plans to replace insulation and to conduct walk downs of expanded scope replacement areas to allow for detailed planning for the next outage. NextEra plans to perform walkdowns to identify areas where interference resulting from piping supports, etc., may occur, and areas that will require asbestos abatement. These walk downs are necessary to minimize dose to personnel and to reduce the amount of rework necessary to obtain the appropriate final configuration. The final design and significant portions of fabrication will be deferred until all locations can be physically accessed and these details verified. These walkdowns will permit development of detailed drawings to support the insulation replacement. This will reduce the potential re-work that is required and will maintain personnel radiation exposure ALARA, while also minimizing the time of worker exposure to asbestos.

During the spring 2013 refueling outage, NextEra will complete modifications to resolve GSI-191 at PBNP Unit 1. This includes replacement of insulation from an expanded scope that results from industry issues.

Unit 2

During the fall 2009 outage NextEra installed three (3) additional strainer modules on each train of existing strainers, structurally reinforced the strainer assemblies to accommodate an increased differential pressure and began implementation of the fiber reduction effort. This included replacement of the insulation on the steam generator channel heads and insulation on the reactor coolant system loop piping. Additionally, the work scope included conducting detailed walkdowns of applicable sections of the pressurizer, CVCS letdown line, steam generator blowdown lines, RTD bypass lines, safety injection lines, and RHR suction lines. These walkdowns were performed in preparation for replacing the insulation in these areas during a subsequent outage.

During the current operating cycle, two specific areas will be addressed. The first area is source term reduction. NextEra has completed an assessment and is evaluating actions to reduce the overall dose rate which could be implemented before and subsequent to the spring 2011 outage. Items being evaluated include operation of both reactor coolant pumps during cool down to minimize corrosion product plate-out, maximizing purification flow rates, assuring that one reactor coolant pump remains in service until a predetermined RCS activity target is met, and the use of specialize resins to reduce coolant contamination. Based on industry experience, the benefits of a dose reduction plan may take several cycles to fully realize. Although results vary by station and data do not exist to specifically predict the dose reduction for PBNP, these strategies have been shown by industry experience to potentially provide significant reductions in primary piping dose rates.

In addition to the dose concern discussed above, there are unresolved generic industry issues that could expand the scope of insulation replacement. The second area is to identify expansion of the replacement scope resulting from resolution of the generic industry issues. During the current operating cycle, NextEra will determine if insulation scope expansion is needed and to finalize the list of insulation requiring replacement.

During the spring 2011 refueling outage, NextEra plans to replace insulation and to conduct walk downs of expanded scope replacement areas to allow for detailed planning for the next outage. NextEra plans to perform walkdowns to identify areas where interference resulting from piping supports, etc., may occur, and areas that will require asbestos abatement. These walk downs are necessary to minimize dose to personnel and to reduce the amount of rework necessary to obtain the appropriate final configuration. The final design and significant portions of fabrication will be deferred until all locations can be physically accessed and these details verified. These walkdowns will permit development of detailed drawings to support the insulation replacement. This will reduce the potential re-work that is required and will maintain personnel radiation exposure ALARA, while also minimizing the time of worker exposure to asbestos.

During the fall 2012 refueling outage, NextEra will complete actions to resolve GSI-191 at PBNP Unit 2. This includes replacement of insulation from an expanded scope that results from industry issues.

Summary of Milestones

Description	Date
Unit 2 Partial Fibrous Insulation Replacement and Detailed Walkdowns	U2R30 Refueling Outage (October 2009) - Complete
Telephone Conference between NextEra and NRC to address comment resolution	March 17, 2010
Submittal of NextEra Response to Request for Additional Information	60 days following issuance of Request for Additional Information
Perform Unit 1 Partial Insulation Replacement and Detailed Walkdowns	U1R32 Refueling Outage (Currently scheduled to begin on March 1, 2010)
Complete GSI-191/GL 2004-02 related analyses	December 31, 2010
Perform Unit 2 Partial Insulation Replacement and Remaining Detailed Walkdowns	U2R31 Refueling Outage (Currently scheduled to begin on March 1, 2011)
Perform Unit 1 Partial Insulation Replacement and Remaining Detailed Walkdowns	U1R33 Refueling Outage (Currently scheduled to begin on October 1, 2011)
Complete Unit 2 Insulation Replacement	U1R32 Refueling Outage (Currently scheduled to begin on October 7, 2012)
Complete Unit 1 Insulation Replacement	U1R34 Refueling Outage (Currently scheduled to begin on April 1, 2013)

3.2 Mitigative Measures / Physical Improvements

The following summarizes mitigative measures that NextEra has established and implemented to minimize the risk of degraded ECCS and CSS functions during the proposed extension period.

1. Hardware Modifications

Unit 1

During the spring 2007 refueling outage, a new strainer design was installed on the ECCS system in containment. This design increased the available flow area from approximately 21 ft^2 to approximately 1,500 ft^2 for each of two redundant strainers on the ECCS recirculation piping. This design also reduced the size of the flow openings from 0.125-inch to 0.066-inch diameter and greatly reduced the approach velocity of the openings to allow for increased settling of particulates and fiber. A prototype of this design was successfully tested during May 2006 with scaled flow and debris.

Testing conforming to the latest PCI protocols was conducted in July 2008 which showed that the installation of additional strainer modules and a reduction in fibrous debris arriving at the strainers would be effective and result in acceptably low head loss, even in the presence of limiting chemical effects. As a result of the July 2008 large flume testing, additional hardware modifications have been made. These modifications increased each strainer train area from approximately 1,500 ft^2 square feet to approximately 1,900 ft^2 and structurally reinforced the strainer assemblies to accommodate an increased differential. Lastly, debris interceptors designed to reduce the quantity of suspended debris that could be transported to the screen surface were installed and the refueling cavity drain piping was rerouted to direct debris suspended in containment spray water from these areas to upstream of the debris interceptors. While subsequent informational testing of a prototype debris interceptor did not achieve the high efficiency desired, the prototype did exhibit the ability to significantly reduce the quantity of suspended fibrous debris. These changes were implemented during the fall 2008 refueling outage.

Unit 2

During the fall 2006 refueling outage, a new strainer design was installed on the ECCS system in containment. This design increased the available flow area from approximately 21 ft^2 to approximately 1,500 ft^2 for each of two redundant strainers on the ECCS recirculation piping. This design also reduced the size of the flow openings from 0.125-inch to 0.066-inch diameter and greatly reduced the approach velocity of the openings to allow for increased settling of particulates and fiber. A prototype of this design was successfully tested during May 2006 with scaled flow and debris.

During the fall 2009 refueling outage NextEra installed three (3) additional strainer modules to increase each strainer train area from approximately 1,500 ft^2 square feet to approximately 1,900 ft^2, structurally reinforced the strainer assemblies to accommodate an increased differential pressure and initiated the fibrous insulation reduction effort.

2. Coatings Inspections and Qualification

Inspections of the protective coatings in containment are performed on a refueling outage frequency. Inspections of the pressurizer and reactor coolant system (RCS) loop compartments are performed during alternate outages, due to ALARA considerations. The inspections are part of a protective coatings program complying with Regulatory Guide 1.54, Service Level I, II and III Protective Coatings Applied to Nuclear Plants, dated June 1973, and ANSI N101.4-1972, Quality Assurance for Protective Coatings Applied to Nuclear Facilities, dated November 28, 1972, to ensure that coatings do not adversely affect safety-related systems, structures or components. Information was previously provided to the Commission on this subject in response to a request for additional information associated with EN 42129 reported on November 8, 2005, and in letters dated February 16, 2006 (ML060860028), May 12, 2006 (ML061420158), and May 19, 2006 (ML06120132). The NRC issued a safety evaluation on this subject on September 18, 2006 (ML060880084).

3. Containment Cleanliness

NextEra has established procedural controls to limit potential debris sources in the containments. These procedures address periodic inspections and assessment of latent debris, control of insulation changes, control of metallic aluminum and control of introduced non-metallic materials such as tags, labels, tie-wraps, etc. inside containment. In MODE 1 through MODE 4, the containment is a special foreign material exclusion zone requiring strict controls on the types and quantities of materials that may be taken into or left inside of the containment buildings.

Latent fiber and particulate debris resident in the containments have been quantified and the results demonstrate that the latent debris inventory is substantially lower than that assumed in the debris generation calculations.

4. Procedure Guidance

Emergency operating procedure (E0P) 1.3, Transfer to Containment Sump Recirculation-Low Head Injection, directs operators to monitor for sump performance. If blockage is indicated, emergency contingency procedure (ECA) 1.3, Containment Sump Blockage, directs plant staff to mitigate the effects of the blockage and to restore core injection.

5. Safety Features and Margins in Current Configuration/Design

The PBNP containment sumps incorporate design features that help to minimize the possibility of strainer blockage. The containment sump is the lowest full containment floor elevation. The screens are located outside the reactor coolant system (RCS) loop compartments to minimize the potential for damage from a high energy pipe failure. There are two redundant trains to minimize the potential for a single failure resulting in loss of function. The sump screens rest on supports that are slightly off the sump floor, rather than mounted in a depressed sump that could collect debris and obstruct active screen area.

NextEra uses sodium hydroxide as a sump pH buffer. The sodium hydroxide is added via the containment spray system while spray is drawing from the refueling water storage tank (RWST). The duration of this spray is limited by the available RWST inventory and would be terminated when the RWST is depleted. Modifications are being installed to permit continuing containment spray using recirculated containment sump water in anticipation of adoption of the alternative

source term (AST) methodology, if approved by the Commission (ML0834506783). If this change is implemented, containment spray duration may be extended for up to approximately four hours post-LOCA. Containment spray would be terminated after it is no longer effective for radionuclide scrubbing.

Calculations of aluminum corrosion were performed in accordance with the guidance of WCAP-16530-NP, Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191, Revision 0, dated February 2006. To conservatively bound the maximum time that spray may remain in operation, it was assumed that spray would continue for six (6) hours after which time it would be manually secured. As noted earlier, the July 2008 test program that credited installation of three new strainers per train and the installation of debris interceptors, demonstrated that there were minimal chemical effects on the sump NPSH.

3.3 Basis for Continued Operation / Acceptability of Proposed Schedule

In Generic Letter 2004-02, the NRC staff provided a justification for continued operation for pressurized water reactors through December 31, 2007. The following operability elements remain applicable at PBNP Units 1 and 2 and provide assurance that the ECCS can perform its safety function in the event of a LOCA during the proposed extension period.

1. Switchover to recirculation from the sump during a large break LOCA would not occur until at least 27 minutes after accident initiation, allowing time for much of the debris to settle in other places within containment.

2. The probability of the initiating event is extremely low.

NextEra is currently in the Fourth 10-Year Interval of the in-service inspection (ISI) program. During the Third Interval, which ended in 2002, 100% of the RCS piping ultrasonic test (UT) examinations required by ASME Section XI were completed with no rejectable flaws detected. The scope of the inspections included all sizes of piping within the RCS pressure boundary, including large, medium, and small bore.

For the Fourth 10-Year Interval, NextEra has implemented a risk-informed approach to the selection of weld examinations, as provided in NRC safety evaluation, Evaluation of Risk Informed In-service Inspection Program, dated July 2, 2003 (ML031630940). This approach uses probabilistic risk assessment (PRA), risk ranking and degradation mechanisms to arrive at the weld examination program plan. UT inspections completed to date have not revealed any rejectable flaws. Additionally, at the end of every refueling outage, the Code-required VT-2 visual examination for leakage is conducted on the RCS. No through-wall leaks have been detected during the pressure tests.

The current industry issue regarding Primary Water Stress Corrosion Cracking (PWSCC) associated with Alloy 600/82/182 welds is of minimal significance at PBNP. The pressurizers, reactor vessels and pumps do not contain Alloy 600/82/182 dissimilar metal welds and are not susceptible to PWSCC. Likewise, the Unit 1 steam generators do not contain Alloy 600/82/182 dissimilar metal welds. These welds are examined in accordance with the requirements of ASME Code Case N-722.

At PBNP, a rapidly propagating failure of the large bore RCS piping components is highly unlikely. The following safety evaluations have been issued by the Commission on this subject:

- Review of Leak-Before-Break Evaluation for Accumulator Line Piping as provided by 10 CFR Part 50, Appendix A, GDC 4, dated November 7, 2000 (ML003767681)

- Review of Leak-Before-Break Evaluation for the Pressurizer Surge Line Piping as provided by 10 CFR Part 50, Appendix A, GDC 4, dated December 15, 2000 (ML003777863)

- Review of Leak-Before-Break Evaluation for the Residual Heat Removal System Piping as provided by 10 CFR Part 50, Appendix A, GDC 4, dated December 18, 2000 (ML003777964)

- Supplement to Safety Evaluation on Leak-Before-Break Regarding Correction of Leak Detection Capability, dated February 7, 2005 (ML04358008)

- Issuance of Amendments RE: Leak-before-Break Evaluation for Primary Loop Piping, dated June 6, 2005 (ML043360295)

As can be seen, the Leak-Before-Break analyses include the RCS primary loop piping, SI accumulator discharge lines to the RCS, the pressurizer surge line, and the high pressure RHR piping connections to the RCS. The analyses encompass essentially all of the large and medium bore piping considered in-scope for GSI-191/GL 2004-02. NRC review and acceptance of these analyses demonstrate that a rapidly propagating failure of the large bore RCS piping components at PBNP is unlikely.

The remaining RCS pressure boundary piping 2" or greater that is not addressed in the Leak-Before-Break analyses consists of:

- Letdown line (short 8" "pot" adjacent to the main loop piping reducing to a 2" line)
- Short branch of capped 6" pipe off the main loop piping (1 per loop)
- Short branch of capped 4" pipe off the main loop piping (1 per loop)
- Pressurizer safety valve lines (4")
- Pressurizer PORV and spray lines (3")
- RTD manifold lines (2" and 3")
- Charging line (3")
- Excess letdown connection (2", reducing to ¾")

These lines were constructed with compatible materials, design pressures, temperatures, and NDE requirements like those previously analyzed in the Leak-Before-Break analyses. Therefore, it is reasonable to conclude the lines are also unlikely sources of rapidly propagating failures of the RCS pressure boundary.

If the remaining RCS pressure boundary piping 2" or greater was to be considered of lower reliability, NextEra has determined that a reduction in fiber debris generation from the worst case analyzed break needs to be 75% or more (i.e., reduced to 25% or less than the previously analyzed debris quantity). The largest piping that has not been analyzed for Leak-Before-Break described above is the short 8" diameter "pot" at the junction of the RCS loop piping and the letdown line.

The main RCS loop piping varies in size from 27.5" to 31" inside diameter, while the 8" diameter "pot" has an inner diameter of 7.2". The ratio of diameters (and therefore ZOI sizes) ranges from 23% to 26%. The maximum quantity of debris that could be generated by a complete severance of the 8" diameter "pot" is bounded by 26% of that calculated for the worst case RCS loop piping break. This is near the upper threshold for acceptable debris generation.

Realistically however, the ratio of debris that would be generated is likely to be closer to the ratio of the cube of the pipe diameters (i.e. the volumes of the ZOIs). This ratio ranges from 1.3% to 1.8%, and provides assurance that a complete break of the limiting 8" diameter "pot" piping would not result in generating an unacceptably large quantity of fibrous debris. This same approach may be applied to the smaller diameter lines to arrive at even smaller fractions of debris generation.

The combination of acceptable ISI test results, minimal primary water stress corrosion cracking (PWSCC) susceptibility, upgraded sump strainers, minimal quantity of debris that can be credibly generated from smaller-medium and small bore piping, and Leak-Before-Break piping analyses provide strong assurance that a postulated LOCA which results in a challenge to the proper functioning of the sump strainers is not likely during the proposed extension period.

3.4 Risk Evaluation

Generic Letter 2004-02 provides the following observations regarding risk significance that remain valid through the completion of the Unit 1 and 2 final design changes.

As discussed in Section 3.3 above, based on the results of continuing in-service inspections and on completed leak-before-break analyses, the probability of a rapidly propagating failure of all large and most medium bore piping is very low. Additionally, there is high confidence piping that has not been rigorously evaluated by a leak-before-break analysis is sufficiently small so a rupture of the piping would not jeopardize the proper functioning of the containment sump screens. Further, the July 2008 test program that credited installation of three new strainers per train and debris interceptors also demonstrated that there were minimal chemical effects on the sump net positive suction head (NPSH).

The probability of a large break LOCA remains extremely low, as does the probability of a small break LOCA that may require recirculation. The PBNP containment is open; eliminating areas of flow restriction that could concentrate flow and promote debris transport. The minimum time to switchover to recirculation (at least 27 minutes after initiation of an event) allows for significant settling of debris suspended by the initial blast and the initial wash-down of containment by containment spray.

The evaluation of downstream effects was developed using a fibrous debris inventory that will be reduced as a result of the fiber reduction effort, a conservative quantity of latent debris and a conservative quantity of coating debris. Therefore, there is margin in the evaluation of ex-core downstream effects. The evaluations, with this margin included, concluded that:

- The PBNP ECCS and containment spray system (CSS) valves, heat exchanger tubing, instrument tubing, piping and orifices were found to have adequate thickness such that erosive wear due to debris laden fluid will not compromise the design functions of these components for the required mission times.

- The degradation of hydraulic performance for the designated mission times is acceptable based on the methodology provided in WCAP-16406-P, PRA Modeling Template for Sump Blockage. Therefore, the pump capabilities credited in the FSAR and licensing bases analyses to ensure that peak fuel cladding temperature (PCT) limits continue to meet the design basis requirements during the time and flow critical transient portion of a design basis loss-of-coolant accident (LOCA).

- Residual heat removal (RHR), CSS and high head safety injection (HHSI) pump mechanical shaft seals are expected to perform satisfactorily with the debris laden fluid following a postulated LOCA for the designated mission times.

- Using the WCAP-16406-P wear model, it was determined that the potential extent of wear on the high head safety injection (HHSI) pumps would not adversely affect pump vibration or hydraulic efficiency and the HHSI pump meets the requirements for vibration operability following a postulated LOCA.

- The residual heat removal (RHR), CSS and HHSI pump bearings are anti-friction, oil lubricated ball bearings equipped with various stages of protection against hot liquid leakage from the shaft seals. Hence they would not be affected by potentially debris laden fluid.

- The limiting passageways in the ECCS and CSS were reviewed. The most limiting passageway was confirmed to be larger than the largest assumed debris diameter. Therefore, blockage of the ECCS and CSS passageways due to debris laden fluid is not a concern.

Generic Issue GSI-191 identifies that the current design basis methodology for assessing the potential for debris-induced sump blockage may not be conservative. Westinghouse developed WCAP-16362 which addresses the implications of sump blockage on risk. This WCAP provides a general model for sump blockage, but did not produce quantitative values. The WCAP modeling approach was used in this simplified evaluation.

The risk impact is limited to large-break loss-of-coolant accidents (LOCAs), since only these LOCAs are large enough to create sufficient debris to clog the containment sump. The frequency of a large-break LOCA is 1.33E-06 per year (NUREG CR-6928, Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants, February 2007). Minimal credit is taken for mitigation of sump blockage given a large-break LOCA. At PBNP, mitigation includes transfer of reactor makeup water to the refueling water storage tank (RWST) to allow extended injection. These actions are based upon steps in approved emergency operating procedures. For these recovery actions, a screening value of 0.2 was used for the probability of failing to successfully perform these mitigating activities.

The increase in core damage frequency due to clogging of the sump is calculated as follows:

1.33E-06 per year x (0.2) = 2.66E-07 per year

The calculated increase in the core damage frequency is below the definition of less than 1.0E-06 per year for a "very small change" in core damage frequency, in accordance with Regulatory

Guide 1.174, An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis.

Therefore, the requested extension for Unit 1 from June 30, 2010, to June 30, 2013 and for Unit 2 from June 30, 2011, to December 31, 2012, does not pose a significant increase in risk.

4.0 Conclusions

In conclusion, an extension for completing the GSI-191/GL 2004-02 corrective actions by June 30, 2013, for PBNP Unit 1, and to December 31, 2012, for PBNP Unit 2, is acceptable based upon the following:

1. The calculated increase in the core damage frequency is below the Regulatory Guide 1.174 definition of less than 1.0E-06 per year for a "very small change" in core damage frequency. Extending the time to demonstrate compliance to June 30, 2013, for PBNP Unit 1 and December 31, 2012, for Unit 2 does not pose a significant increase in risk.

2. NextEra has taken, and is continuing to take, aggressive action in order to achieve compliance with GI-191/GL 2004-02. This includes installation of additional strainers, structural reinforcement of the strainer assemblies and a significant fiber reduction effort.

3. NextEra has implemented mitigative measures to minimize the risk of degraded ECCS functions during the extension period. These measures include the installation of strainers with substantially increased surface area, improved monitoring of containment coatings condition, improved monitoring and control of containment cleanliness and procedural action in the unlikely event of sump screen blockage.

4. NextEra has a plant-specific plan with milestones to address the outstanding technical issues.