June 30, 2014

L-2014-171
10 CFR 50.4
10 CFR 50.55a

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

Re: St. Lucie Unit 2
Docket No. 50-389
Inservice Inspection Plan
Fourth Ten-Year Interval Unit 2 Relief Request No. 3, Revision 0

In accordance with 10 CFR 50.55a(a)(3)(i), Florida Power & Light (FPL) requests relief from the ASME Section XI, Appendix VIII, Supplement 11 qualification requirements for full structural overlaid wrought austenitic piping welds. FPL requests approval to use the proposed alternatives as implemented by the Performance Demonstration Initiative(PDI) program to the requirements within ASME Section XI, 2007 Edition 2008 Addenda, Appendix VIII, Supplement 11, "Qualification Requirements for Full Structural Overlaid Wrought Austenitic Piping Welds." Compliance with the proposed alternatives within this relief request, versus those in the 2007 Edition with 2008 Addenda of ASME Section XI, Appendix VIII, Supplement 11, will provide an acceptable level of quality and safety.

Please contact Ken Frehafer at (772) 467-7748 if there are any questions about this submittal.

Sincerely,

Eric S. Katzman
Licensing Manager
St. Lucie Plant

Attachment
ESK/KWF

A047
NRR

St. Lucie Unit 2
FOURTH INSPECTION INTERVAL
RELIEF REQUEST NUMBER 3, REV. 0

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Component(s) Affected

Class 1 Pressure Retaining Piping Welds subject to Ultrasonic (UT) examination using procedures, personnel, and equipment qualified by demonstration to ASME Section XI, 2007 Edition with 2008 Addenda, Appendix VIII, Supplement 11.

2. Applicable Code Edition and Addenda

The Code of record for St. Lucie Unit 2 is the 2007 Edition with 2008 Addenda of ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."

3. Applicable Code Requirement

ASME Section XI, Appendix VIII provides requirements for performance demonstration for ultrasonic examination systems.

ASME Section XI, Appendix VIII, Supplement 11 provides the "Qualification Requirements for Full Structural Overlaid Wrought Austenitic Piping Welds."

4. Reason for Request

The qualification requirements in Appendix VIII, Supplement 11 of the 2007 Edition with the 2008 Addenda of Section XI were written strictly for weld overlay repairs designed as full structural replacements for the original weld and base material beneath them. The volumetric examination coverage required for full structural weld overlays was the thickness of the overlay, plus the outer 25% of the original weld and base material.

Since Supplement 11 was last updated in the 2005 Addenda of Section XI, the industry has begun to use overlay repairs on larger piping systems for which full structural overlays are not practical due to the weight they would add to the piping system and the time it would take to install them.

These new "optimized" weld overlays are thinner and are designed as a partial structural replacement to the original piping. They are only designed as a repair for up to a 75% through-wall circumferential crack, instead of a 100% through-wall crack.

Because of this design approach, Code Case N-653-1 was written to include volumetric examination requirements of outer 50% of the original base material (a 25% increase over the Supplement 11 requirement). In addition, Code Case N-653-1 contains provisions to allow for qualification of this extended examination volume.

The industry utilizes the Performance Demonstration Initiative (PDI) program for the qualification of equipment, procedures, and personnel. The PDI Program does not meet all aspects of the Code requirements identified in ASME Section XI, Appendix VIII, Supplement 11 of the 2007 Edition with Addenda through 2008. As a result, Requests for Relief have been approved and are the basis for the implementation of the PDI Program for Supplement 11.

The PDI program provides provisions qualification requirements for detection, length, and depth sizing for both service induced and fabrication induced flaws. The program is applicable to wrought austenitic, ferritic, or dissimilar metal welds overlaid with austenitic weld material. The scope of Appendix VIII, Supplement 11, has been expanded to address this change in the attached table.

5. Proposed Alternative and Basis for Use

Proposed Alternative

Pursuant to 10CFR 50.55a (a)(3)(i), Florida Power and Light Company (FPL) requests approval to use the proposed alternatives as implemented by the PDI program to the requirements within ASME Section XI, 2007 Edition 2008 Addenda, Appendix VIII, Supplement 11, "Qualification Requirements for Full Structural Overlaid Wrought Austenitic Piping Welds" as shown in the attached Table for the performance demonstration for ultrasonic (UT) examination procedures, equipment, and personnel.

A two column Table is provided showing the ASME Section XI, Supplement 11 of the 2007 Edition with Addenda through 2008 and the proposed alternatives as implemented by the PDI program

Basis for Use

Compliance with the proposed alternatives within this relief request, versus those in the 2007 Edition with 2008 Addenda of ASME Section XI, Appendix VIII, Supplement 11, will provide an acceptable level of quality and safety for the qualification of equipment, procedures, and personnel for examinations of overlays. The attached Table provides alternative requirements for a broader scope of weld overlays and the technical requirements for the qualification have been modified so that an acceptable level of quality and safety is maintained.

1) The scope was changed to broaden the applicability of Supplement 11

The title of ASME Section XI, Supplement 11 in the 2007 Edition with Addenda through 2008 is "Qualification Requirements for Full Structural Overlaid Wrought Austenitic Piping Welds." When originally written, this was accurate for the extent of usage of weld overlay repairs. However, the use of weld overlays has broadened. Weld overlays are now being designed that are not intended as full-structural replacements to the original weld and base material. In addition, weld overlays are now being applied over cast austenitic stainless steel piping welds, as well as wrought. Therefore, the alternatives proposed within this relief request are required broaden the applicability of Supplement 11 as written in the 2007 Edition with Addenda through 2008 of the ASME Section XI Code.

2) The names of the grading units were changed from *base metal* and *overlay fabrication* to *inservice* and *preservice*, respectively.

Originally, Supplement 11 was written to cover the examination of weld overlay repairs of BWR recirculation piping welds, which were applied due to SCC cracking. At the time, SCC cracking was only occurring in the base metal adjacent to the weld (in the heat affected zone). Therefore, for qualification purposes, it was appropriate to refer to the grading units intended to contain cracking in the original pipe as "base metal" grading units.

Subsequently, mechanisms have been discovered that cause cracking not only in the base metal, but also in the weld and buttering of these types of welds. And overlays are being applied to welds in PWRs, as well, where the cracking is primarily found in the weld and buttering material.

Therefore, it is now more appropriate to call the grading unit for the original piping as an *"inservice"* grading unit, which is a broad enough term to encompass flaws in the base material or weld material. And since the term for grading units in the original piping was being changed to *"inservice"*, it seemed appropriate to change the term for grading units intended to contain fabrication related discontinuities in the weld overlay (i.e. bonding and weld cleanliness) to *"preservice"*. It is during the preservice inspection that these indications are expected to be discovered.

3) The term *base metal flaws* was changed to *service-induced flaws* and the term *overlay fabrication flaws* was changed to *fabrication-induced flaws* in this revision.

This relief request proposes using *"service-induced flaws"* as an alternative to the term *"base metal flaws"* and *"fabrication-induced flaws"* as an alternative to *"overlay fabrication flaws"* to describe the flaw types to make them broad enough to encompass all currently recognized degradation mechanisms.

4) Provisions have been added for qualification of "optimized" weld overlays.

The qualification requirements provided in ASME Section XI, Appendix VIII, Supplement 11 were written strictly for weld overlay repairs designed as full structural replacements for the original weld and base material beneath them. The volumetric examination coverage required for full structural weld overlays was the thickness of the overlay, plus the outer 25% of the original weld and base material.
Since that time, the industry has begun to use overlay repairs on larger piping systems, for which full structural overlays are not practical, due to the weight they would add to the piping system and the time it would take to install them. These new "optimized" weld overlays are thinner and are designed as a partial structural replacement to the original piping. They are only designed as a repair for up to a 75% through-wall circumferential crack, instead of a 100% through-wall crack. Because of this, the volumetric examination requirements have also been increased to include the outer 50% of the original base material (a 25% increase over the previous requirement). The proposed alternatives contain provisions to allow for qualification of this extended examination volume.

5) Qualification for width sizing of laminar flaws is now addressed.

The acceptance criteria for laminar flaws in a weld overlay repair are based upon, among other things, the total area of the flaw. However, Supplement 11 only contains provisions for length sizing and is silent on qualification for width sizing. The common technique for both length sizing and width sizing of laminar flaws is to map the edges of the flaw using a 0° (straight beam) transducer. There is virtually no difference in these measurements in terms of axial versus circumferential directions. Therefore, this relief request includes a clarifying sentence for the qualification for both length and width sizing of laminar flaws.

6. Duration of Proposed Alternative

FPL will implement the alternative requirements during the fourth 10-year Inservice Inspection interval at PSL-2 which began August 8, 2013 and ends August 7, 2023.

7. Attachments to the Relief

Two column Table providing ASME Section XI, Supplement 11 of the 2007 Edition with Addenda through 2008 and the proposed alternatives as implemented by the PDI program.

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
1.0 SPECIMEN REQUIREMENTS	**SPECIMEN REQUIREMENTS**
Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	Qualification test specimens shall meet the requirements listed in this document, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.
1.1 General. The specimen set shall conform to the following requirements. *(a)* Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	**General** Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.
(b) The specimen set shall consist of at least three specimens having different nominal pipe diameters and overlay thicknesses. They shall include the minimum and maximum nominal pipe diameters for which the examination procedure is applicable. Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent. If the procedure is applicable to pipe diameters of 24 in. (600 mm) or larger, the specimen set must include at least one specimen 24 in. (600 mm) or larger but need not include the maximum diameter. The specimen set shall include at least one specimen with overlay not thicker than 0.1 in. (2.5 mm) more than the minimum thickness, and at least one specimen with overlay not thinner than 0.25 in. (6 mm) less than the maximum for which the examination procedure is applicable.	The specimen set shall consist of at least three specimens having different nominal pipe diameters and overlay thicknesses. They shall include the minimum and maximum nominal pipe diameters for which the examination procedure is applicable. Pipe diameters within a range of 0.9 to 1.5 times the nominal diameter shall be considered equivalent. If the procedure is applicable to pipe diameters of 24 in. (610 mm) or larger, the specimen set must include at least one specimen 24 in. (610 mm) or larger but need not include the maximum diameter. The specimen set must include specimens with overlay not thicker than 0.1 in. (2.5 mm) more than the minimum thickness, and at least one specimen with overlay not thinner than 0.25 in. (6 mm) less than the maximum thickness for which the examination procedure is applicable.

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(c) The surface condition of at least two specimens shall approximate the roughest surface condition for which the examination procedure is applicable.	The surface condition of at least two specimens shall approximate the roughest surface condition for which the examination procedure is applicable.
(d) Flaw Conditions *(1) Base metal flaws.* All flaws must be in or near the butt weld heat-affected zone, open to the inside surface, and extending at least 75% through the base metal wall. Intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the base metal flaws. At least 70% of the flaws in the detection and sizing tests shall be actual cracks. Specimens containing IGSCC shall be used if they are available. If implantation of actual cracks produces spurious reflectors that are not characteristic of actual flaws, alternative flaws may be used but shall comprise not more than 30% of the total of base material flaws. Alternative flaws, if used, shall provide crack-like reflective characteristics and shall be semielliptical. The tip width of the alternative flaws shall not exceed 0.002 in.	**Service-Induced Flaws.** Service-induced flaws must be in or near the weld, buttering, or heat-affected zone, and open to the inside surface. The examination procedure shall specify the examination volume. If the examination procedure specifies an examination volume greater than the outer 25% of the base metal wall thickness, the detection and sizing test sets shall include at least five representative flaws suitable to demonstrate the procedure capability in this extended volume. Intentional fabrication-induced flaws shall not interfere with ultrasonic detection or characterization of the service-induced flaws. At least 70% of the flaws in the detection and sizing tests shall be cracks. Specimens containing stress corrosion cracking (SCC) shall be used when available. If implantation of actual cracks produces spurious reflectors that are not characteristic of actual flaws; alternative flaws may be used but shall comprise not more than 30% of the total of base material flaws. Alternative flaw mechanisms, if used, shall provide crack-like reflective characteristics. The shape of the alternative flaw is intended to simulate the growth pattern of actual flaws and may be semielliptical. The tip width of the alternative flaws shall not exceed 0.002 inches (0.05mm).

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(2) Overlay fabrication flaws. At least 40% of the flaws shall be noncrack fabrication flaws (e.g., sidewall lack of fusion or laminar lack of bond) in the overlay or the pipe-to-overlay interface. At least 20% of the flaws shall be cracks. The balance of the flaws shall be of either type.	**Fabrication-Induced Flaws.** At least 40% of the flaws shall be non-crack fabrication flaws (e.g., sidewall lack of fusion or laminar lack of bond) in the overlay or the pipe-to-overlay interface. At least 20% of the flaws shall be cracks wholly contained in the overlay. The balance of the flaws shall be of either type.
(e) Detection Specimens *(1)* At least 20% but less than 40% of the base metal flaws shall be oriented within ±20 deg of the pipe axial direction. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.	**Detection Specimens.** At least 20% but less than 40% of the service-induced flaws shall be oriented within ±20 deg. of the pipe axial direction. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
(2) Specimens shall be divided into base metal and overlay fabrication grading units. Each specimen shall contain one or both types of grading units. Flaws shall not interfere with ultrasonic detection or characterization of other flaws.	Specimens shall be divided into inservice inspection (ISI) and preservice inspection (PSI) grading units. *ISI Grading Unit.* A grading unit designed to include a portion of the original weld and base material and the weld overlay material above it and designed to contain service-induced flaws (cracks) *PSI Grading Unit.* A grading unit designed to include a portion of the weld overlay, including the interface between the weld overlay and the original weld and base material, and designed to contain fabrication-induced flaw types (e.g. interbead lack of fusion, laminar lack of bond, cracks). Each specimen shall contain one or both types of grading units. Flaws shall not interfere with ultrasonic detection or characterization of other flaws.
(a)(1) A base metal grading unit includes the overlay material and the outer 25% of the original overlaid weld. The base metal grading unit shall extend circumferentially for at least 1 in. (25 mm) and shall start at the weld centerline and be wide enough in the axial direction to encompass one half of the original weld crown and at least $^1/_2$ in. (13 mm) of the adjacent base material. For axially-oriented discontinuities, the axial dimension of the base metal grading unit may encompass the original weld crown and at least $^1/_2$ in. (13 mm) of the adjacent base materials.	ISI grading units include the overlay material and the examination volume specified in the examination procedure. ISI grading units shall extend circumferentially for at least 1 inch (25 mm) and shall start at the weld centerline and shall be wide enough in the axial direction to encompass one-half of the original weld crown and at least ½ inch (13 mm) of the adjacent base material. The grading units shall be of various sizes. For an axially oriented discontinuity, the axial dimension of the ISI grading unit may encompass the original weld crown and at least ½ inch (13 mm) of both adjacent base materials.

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(2) When base metal flaws penetrate into the overlay material, the base metal grading unit shall not be used as part of any overlay grading unit.	If service-induced flaws penetrate into the overlay material, the ISI grading unit shall not be used as part of any PSI grading unit.
(3) Sufficient unflawed overlaid weld and base metal shall exist on all sides of the grading unit to preclude interfering reflections from adjacent flaws.	Sufficient unflawed area shall exist on all sides of the grading unit to preclude interfering reflections from adjacent flaws.
(b)(1) An overlay fabrication grading unit shall include the overlay material and the base metal-to-overlay interface for a length of at least 1 in. (25 mm).	PSI grading units shall include the overlay material and the overlay-to-component interface for a length of at least 1 inch (25 mm).
(2) Overlay fabrication grading units designed to be unflawed shall be separated by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1 in. (25 mm) at both ends. Sufficient unflawed overlaid weld and base metal shall exist on both sides of the overlay fabrication grading unit to preclude interfering reflections from adjacent flaws. The specific area used in one overlay fabrication grading unit shall not be used in another overlay fabrication grading unit. Overlay fabrication grading units need not be spaced uniformly about the specimen.	PSI grading units designed to be unflawed shall be separated by unflawed overlay material and unflawed overlay-to-component interface for at least 1 inch (25 mm) at both ends. Sufficient unflawed overlaid weld and base metal shall exist on both sides of the PSI grading unit to preclude interfering reflections from adjacent flaws. The specific area used in one PSI grading unit shall not be used in another PSI grading unit. PSI grading units need not be spaced uniformly about the specimen.

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(3) Detection sets shall be selected from Table VIIIS2-1. The minimum detection sample set is five flawed base metal grading units, ten unflawed base metal grading units, five flawed overlay fabrication grading units, and ten unflawed overlay fabrication grading units. For each type of grading unit, the set shall contain at least twice as many unflawed as flawed grading units. For initial procedure qualification, detection sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.	Detection sets shall be selected from Table VIII-S2-1. The detection sample sets shall contain at least ten flawed ISI grading units and five flawed PSI grading units. Additionally, for each type of grading unit, the sets shall contain at least twice as many unflawed as flawed grading units. For initial procedure qualification, detection sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.
(f) Sizing Specimen *(1)* The minimum number of flaws shall be ten. At least 30% of the flaws shall be overlay fabrication flaws. At least 40% of the flaws shall be open to the inside surface. To assess sizing capabilities, sizing sets shall contain a representative distribution of flaw dimensions. For initial procedure qualification, sizing sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.	**Sizing Specimens.** Sizing sample sets shall contain at least ten flaws. At least 30% of the flaws shall be fabrication-induced flaws. At least 40% of the flaws shall be service-induced flaws and shall be open to the inside surface. Sizing sets shall contain a representative distribution of flaw dimensions that cover the examination volume specified in the examination procedure. For initial procedure qualification, sizing sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.
(2) At least 20% but less than 40% of the flaws shall be oriented axially. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.	At least 20% but less than 40% of the flaws shall be oriented axially. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
(3) Base metal flaws used for length sizing demonstrations shall be oriented circumferentially.	Service-induced flaws used for length sizing demonstrations shall be oriented circumferentially.
(4) Depth sizing specimen sets shall include at least two distinct locations where a base metal flaw extends into the overlay material by at least 0.1 in. (2.5 mm) in the through-wall direction.	Depth sizing specimen sets shall include at least two distinct locations where a service-induced flaw extends into the overlay material by at least 0.1 inches (2.5 mm) in the through-wall direction.
2.0 CONDUCT OF PERFORMANCE DEMONSTRATIONS The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited. The overlay fabrication flaw test and the base metal flaw test may be performed separately.	**PERFORMANCE DEMONSTRATION** The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited. The PSI test and the ISI test may be performed separately.
2.1 Detection Test. Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (base or overlay) that are present for each specimen.	**Detection Test.** Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (ISI or PSI) in each specimen.

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
2.2 Length Sizing Test *(a)* The length sizing test may be conducted separately or in conjunction with the detection test.	**Length Sizing Test** Length sizing tests may be conducted separately or in conjunction with the detection test.
(b) If the length sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements of 1.1(f), additional specimens shall be provided to the candidate. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	If the length sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements for the sizing specimens detailed above, additional specimens shall be provided to the candidate. The regions of the additional specimens containing flaws to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.
(c) For a separate length sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	For a separate length sizing test, the regions of each specimen containing flaws to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.
(d) For flaws in base metal grading units, the candidate shall estimate the length of that part of the flaw that is in the outer 25% of the base metal wall thickness.	For flaws in ISI grading units, the candidate shall estimate the length of that part of the flaw that is in the examination volume specified in the examination procedure.
2.3 Depth Sizing Test *(a)* Depth sizing consists of measuring the metal thickness above the flaw (i.e., remaining ligament), and may be conducted separately or in conjunction with the detection test.	**Depth Sizing Test** Depth sizing consists of measuring the metal thickness above the flaw (i.e., remaining ligament) and may be conducted separately or in conjunction with the detection test.

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
(b) If the depth sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements of 1.1(f), additional specimens shall be provided to the candidate. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	If the depth sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements for the sizing specimens above, additional specimens shall be provided to the candidate. The regions of the additional specimens containing flaws to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.
(c) For a separate depth sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	For a separate depth sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.
3.0 ACCEPTANCE CRITERIA	**ACCEPTANCE CRITERIA**

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
3.1 Detection Acceptance Criteria. (a) Examination procedures shall be qualified as follows: *(1)* All flaws within the scope of the procedure shall be detected, and the results of the performance demonstration shall satisfy the acceptance criteria of Table VIII-S2-1 for false calls. *(2)* At least one successful personnel demonstration shall be performed meeting the acceptance criteria defined in 3.1(b).	**Procedure Qualification** In addition to the specimen and performance demonstration requirements, procedure qualification shall satisfy the following; The specimen set shall include the equivalent of at least three personnel performance demonstration test sets. Successful personnel demonstrations may be combined to satisfy these requirements. At least one successful personnel demonstration shall be performed. Detectability of all flaws in the procedure qualification test set within the scope of the procedure shall be demonstrated. Length and depth sizing shall meet the requirements of the below paragraphs.
(b) Examination equipment and personnel shall be considered qualified for detection if the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls.	Examination equipment and personnel shall be considered qualified for detection if the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls. If the procedure is intended to be used to examine greater than the upper 25% of the original pipe volume, a candidate for personnel qualification shall not fail to detect more than one of the flaws located in the extended volume

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
(c) The criteria in 3.1(a) and 3.1(b) shall be satisfied separately by the demonstration results for base metal grading units and by those for overlay fabrication grading units.	The detection test, length sizing test, and depth sizing test criteria shall be satisfied separately by the demonstration results for ISI grading units and by those for PSI grading units.
3.2 Sizing Acceptance Criteria. Examination procedures, equipment, and personnel are qualified for sizing when the results of the performance demonstration satisfy the following criteria. *(a)* The RMS error of the flaw length measurements, as compared to the true flaw lengths, is less than or equal to 0.75 in. (19 mm). The length of a base metal flaw is measured at the 75% through-base-metal position.	Examination procedures, equipment, and personnel are qualified for length sizing if the RMS error of the circumferential flaw length measurements, compared to the true circumferential flaw lengths, is not more than 0.75 in.(19mm). The length of a service-induced flaw is measured in accordance with the length sizing test requirements. Examination procedures, equipment, and personnel qualified for length sizing in accordance with the criteria above are considered qualified for both length and width sizing of laminar flaws.
(b) The RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 in. (3.2 mm).	Examination procedures, equipment and personnel are qualified for depth sizing if the RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 in (3.2 mm).

2007 Edition with 2008 Addendum ASME, Section XI, Appendix VIII	PDI Program
(b) The RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 in. (3.2 mm).	Examination procedures, equipment and personnel are qualified for depth sizing if the RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 in (3.2 mm).