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

FPL

September 29, 2003

L-2003-245
10 CFR 50.90

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

RE: St. Lucie Unit 1
Docket No. 50-335
RAI Response for Proposed Amendment
Spent Fuel Pool Soluble Boron Credit

By letter L-2002-221 dated November 25, 2002, Florida Power & Light (FPL) submitted a proposed license amendment (PLA) to revise the St. Lucie Unit 1 Technical Specifications (TS). The proposed amendment eliminates the need to credit Boraflex™ neutron absorbing material for reactivity control in the spent fuel pool (SFP) and instead credits a combination of soluble boron and fuel position in the storage racks to maintain reactivity within the effective neutron multiplication factor (k_{eff}) limits of 10 CFR 50.68.

By letter dated March 31, 2003, the Nuclear Regulatory Commission (NRC) staff requested information to support the submittal review. FPL responded to the NRC request in letter L-2003-125 dated May 14, 2003. Subsequently, the NRC staff requested additional information in a letter dated August 21, 2003. FPL discussed preliminary responses with the Staff, but note that the attached responses are not identical to the draft responses. Wording changes were made as needed to clarify the information. This letter contains the FPL response.

The original Determination of No Significant Hazards Consideration bounds the information provided in this RAI response. In accordance with 10 CFR 50.91(b)(1), a copy of the RAI response is being forwarded to the State Designee for the State of Florida.

The plan for implementing the proposed amendment was also discussed with NRC staff. FPL requests that the amendment be effective on the date of issuance, with implementation completed by September 30, 2004. Assuming the amendment will be approved by early 2004, the interim period allowed for implementation will allow for all the necessary fuel movement to be completed and verified, and will allow for installation of the Unit 1 cask pit rack prior to the proposed TS implementation. Cask pit rack installation is tentatively planned for July 2004 and is a necessary prerequisite because it provides the Region 1 storage space necessary for a postulated emergent full core offload. Once the spent fuel pool is verified to be in its conforming configuration (and the cask pit rack installed), FPL will notify NRC that the new Technical Specifications have been implemented.

A001

Please contact us if there are any questions about this submittal.

Very truly yours,

William Jefferson, Jr.
Vice President
St. Lucie Plant

WJ/KWF

Attachment

cc: Mr. W. A. Passetti, Florida Department of Health

STATE OF FLORIDA)
)ss.
COUNTY OF ST. LUCIE)

William Jefferson, Jr. being first duly sworn, deposes and says:

That he is Vice President, St. Lucie Plant, of Florida Power and Light Company, the Licensee 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 Licensee.

William Jefferson, Jr.

STATE OF FLORIDA

COUNTY OF ST. LUCIE

Subscribed and sworn to before me this

29 day of Sept., 2003.

Leslie J. Whitwell
Name of Notary Public (Type or Print)

William Jefferson, Jr. is personally known to me.

Leslie J. Whitwell
MY COMMISSION # DD020212 EXPIRES
May 12, 2005
BONDED THRU TROY FAIN INSURANCE, INC.

RAI Responses

RESPONSES TO

REQUEST FOR ADDITIONAL INFORMATION

SPENT FUEL POOL SOLUBLE BORON CREDIT AMENDMENT

ST. LUCIE PLANT, UNIT 1

DOCKET NO. 50-335

1. In the original amendment request, the licensee stated that it determined the bounding assembly by analyzing the two assembly types currently stored in the spent fuel pool (SFP) for both the upper-bound and lower-bound cladding thicknesses. Additionally, the licensee stated that it analyzed the various enrichments, cooling times, and burnups for both Region 1 and 2 racks. Since the licensee's determination of the bounding assembly excluded consideration of most of the manufacturing tolerance reactivity effects, describe how it can be assured that the final calculated maximum effective multiplication factor (k_{eff}) bounds the other assembly type.

Response:

The manufacturing tolerance values are very similar between the two fuel assembly types stored in the Unit 1 SFP (CE 14x14 and Framatome (formerly known as Exxon) 14x14). For this reason, the reactivity effects of these tolerances are similar, and the limiting fuel assembly design for each fuel storage region has been correctly specified. To support this conclusion, the effect on k_∞ of fuel tolerances for non-bounding assemblies in the St. Lucie Unit 1 spent fuel storage racks has also been examined. Specifically, the reactivity effect of tolerances has been analyzed for CE 14x14 fuel stored in a Region 1 rack and Framatome 14x14 fuel stored in a Region 2 rack. The analyses were performed for 1.9 w/o U-235 initial enrichment and a zero cooling time condition, because the original CASMO calculations for the bounding fuel types produced the highest combined tolerance effect in each rack at these conditions. As in the earlier CASMO calculations, bounding tolerance values were used in this analysis.

Calculations for Region 1 with the non-bounding CE 14x14 assembly design produced a slightly lower (i.e., 0.0005 Δk) combined tolerance effect. Calculations for Region 2 with the non-bounding Framatome 14x14 assembly design produced a combined tolerance effect that was the same as the bounding fuel type.

In summary, these results demonstrate that, when the effect of manufacturing tolerances is considered, the assembly type chosen as the bounding assembly remains limiting.

2. In its May 14, 2003, request for additional information response, the licensee provided additional information regarding its proposed use of control element assemblies (CEAs) for reactivity control in the SFP. The repeated use of CEAs for multiple cycles may result in bowing, cracking, depletion or other properties which would make them unsuitable for crediting in an SFP criticality analysis. Provide additional information to describe the verification process to be used to determine the acceptability of a CEA before it is placed in the SFP and used for reactivity control. Specifically, describe in greater detail the analysis of the depletion effects on the criticality analyses, the typical life-span of CEAs in the St. Lucie Unit 1 reactor, any previously identified abnormalities in CEAs following removal from the reactor, and any procedures that will be used to determine the acceptability of individual CEAs.

Response:

The acceptability of CEAs for reactivity control in the Unit 1 SFP storage racks is established by considering the conditions CEAs experience while they are in the reactor and by an assessment of their performance after exposure to these conditions. Any CEA acceptable for use in the core is judged acceptable for reactivity control in spent fuel storage racks. Further, the in-reactor lifetime of a CEA is viewed as unaffected by residence in spent fuel storage racks. FPL has performed a unit-specific evaluation of the environmental factors affecting CEAs during reactor operation, including fretting wear, fast neutron flux, clad strain, and poison depletion. From this evaluation and the results of an earlier measurement and inspection campaign of CEAs placed in the SFP, conservative values of CEA in-reactor lifetime have been established. The following paragraphs discuss these CEA evaluation aspects.

CEA poison depletion

As stated in FPL letter L-2003-125 to the NRC dated May 14, 2003, RAI Response for Spent Fuel Pool Soluble Boron Credit, the Unit 1 criticality analyses assume that full strength CEAs used for SFP reactivity control contain their initial boron-10 loading (i.e., no depletion has occurred). This assumption is based on calculations considering the effect of partially depleted CEAs performed to support the November 25, 2002, FPL letter L-2002-221 to the NRC Proposed License Amendment, Spent Fuel Pool Soluble Boron Credit submittal and on the following considerations:

CEA fingers at St. Lucie Unit 1 are larger in diameter (~0.948 inches) than control rod fingers used in other fuel assembly designs. These large fingers ensure that the absorber material in each finger presents a "black" surface to neutrons even if some atoms of poison material have been transmuted. In comparison to the core, the neutron flux

encountered in fuel storage racks is very low and it decreases further with increases in post-irradiation cooling time. As a result, CEAs will experience no appreciable poison atom transmutation once they are placed in the fuel storage racks.

Poison depletion while a CEA is in the core is minimized because non-lead bank full strength CEAs are normally fully withdrawn from the active fuel region during power operation. Although repositioning guidelines allow the CEA elevation to vary, the absorber region remains predominately at or above the top of the fuel. Plant Technical Specifications encourage operation with CEAs withdrawn by limiting the depth of CEA insertion for power shaping purposes and by limiting the CEA insertion time during power operation. In addition, St. Lucie Unit 1 fuel reloads have incorporated axial blankets for more than 15 years, thereby reducing axial neutron leakage and further limiting depletion.

Considering the axial positioning of in-reactor CEAs during power operation, any depletion of absorber material will be limited to the bottom portion of CEA fingers, nearest the active fuel. As noted above, full-strength CEA fingers would still remain "black", absorbing essentially all incident neutrons. In any case, upper portions of CEA fingers, nearer the spider would not be depleted. In a fuel pool environment, where CEAs are fully inserted, the upper portions of CEA fingers play a more significant role in controlling local reactivity. This increased significance is because irradiated fuel tends to be more reactive near the top of the fuel column, as a result of the greater plutonium production in this region and the lower accumulated burnup.

CEA poison depletion significant enough to affect reactivity would first be seen as a trend in CEA bank worth measurements during startup physics testing. Startup physics testing reports from Unit 1 Cycles 1 through 17 demonstrate the expected cycle-to-cycle random variance in measured CEA worth due to changes in cycle-specific fuel loading patterns. Measured-to-predicted differences in CEA worth for CEAs that have experienced high duty cycles are within the 10% acceptance criterion. If CEA depletion was occurring, the depletion would cause a trend of decreasing measured worth relative to predicted worth, which has not been observed. For this reason, absorber depletion is considered insignificant over the life-span of the CEAs and accordingly, the Unit 1 criticality analyses use initial Boron-10 loading when modeling CEAs.

Unit 1 CEA life-span

As mentioned in UFSAR Section 4.2.3.2.2, although the original Unit 1 CEA lifetime limit was ten operating years based on finger internal swelling considerations, CEA life-span is now determined by the most limiting of four different mechanisms: (1) poison depletion, (2) clad strain, (3) clad wear, and (4) fast fluence. Of the four mechanisms, cladding wear

(fretting) on the CEA external surface has been found to be the most limiting effect when establishing the life-span of full strength non-lead bank CEAs.

A design basis CEA cladding wear limit has been conservatively established at 40% of the clad wall thickness. This wear limit is well above the highest observed CEA wear of 18%, and is predicted to be reached at an exposure value (expressed in Effective Full Power Days) exceeding nine fuel cycles. This is the basis for the current Unit 1 CEA lifetime.

Previously-identified CEA abnormalities

To assess the condition of Unit 1 CEAs following extended in-vessel service, an inspection campaign was conducted to identify any mechanical abnormalities (e.g., clad wear and clad strain) in the original CEAs that could lead to degradation of the boron carbide (B_4C) poison. The center fingers of the original design full strength CEAs contained B_4C pellets without silver-indium-cadmium (AgInCd) slugs in the tips. Unit 1 currently utilizes an improved full-strength CEA design with AgInCd slugs in all five fingers.

Of the fifty CEAs examined, 46 were original design non-lead bank full strength CEAs, most having an operational duty comprised of Cycles 1 through 9. Eddy current testing and a visual examination demonstrated that there were axial cracks present in the lower portion of the center finger on three out of the 46 original CEAs inspected. The crack lengths were 0.2", 0.2", and 3.4", and were caused by internal material swelling due to neutron interaction. The remaining B_4C center fingers displayed clad strain of less than the one-percent acceptance limit. Aside from the three CEAs with finger cracks, the maximum measured cladding wear on original design non-lead bank full strength CEAs operating through Cycle 9 was 18% through wall. Only one CEA finger experienced this level of wear.

Procedures for determining CEA acceptability

Unit 1 procedures do not specifically assess CEA acceptability for SFP reactivity control. However, the existing procedures for inspecting new CEAs and for periodically testing CEAs to verify acceptable insertion times would identify physical abnormalities that could potentially impact the use of CEAs for reactivity control in the SFP.

Any CEAs found with cracked cladding in fingers will be held in reserve and not credited in the spent fuel pool storage array, unless an inspection campaign or subsequent analysis deems them adequate. Based on analytical methods and measured data obtained from the earlier post-operation inspection, CEAs credited for use in fuel storage racks will be intact and will be operating within design basis limits while performing their reactivity control function.

3. In its amendment request, the licensee proposed to credit CEAs for reactivity control in the SFP. Since CEAs are not an integral (nonremovable) part of a fuel assembly or storage rack, the licensee must provide additional information to support their use. The licensee cited an August 19, 1998, letter from L. Kopp (U. S. Nuclear Regulatory Commission (NRC)) to T. Collins (NRC), "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light-Water Reactor Power Plants," as part of the guidance it used in performing its criticality analyses. Additionally, Regulatory Guide (RG) 1.13, "Spent Fuel Storage Facility Design Basis," provides guidance on the methodology for performing criticality analyses in the SFP. Both documents describe strict controls on the use of fixed and/or removable neutron absorbers. Provide additional information on how the proposed amendment will satisfy the guidance in Section 5.B.5 of the Kopp letter and Section 5.1 (a and c only) of RG 1.13. In responding to the guidance in Section 5.1 (a and c only) of RG 1.13, the licensee should apply these criteria to the removable CEAs proposed to be used in the St. Lucie Unit 1 SFP.

<u>Response</u>:

The guidance of Draft RG 1.13 Section 5.1 allows the use of fixed neutron absorbers for criticality control provided "they are designed and fabricated so as to preclude inadvertent removal by mechanical or chemical action." The use of CEAs for reactivity control in the SFP at St. Lucie Unit 1, as proposed by FPL's license amendment request, is consistent with the requirements discussed in the L. Kopp guidance letter, and is also consistent with the Draft RG 1.13 discussion regarding controls on the use of fixed neutron absorbers.

<u>SFP reconfiguration prior to implementing the proposed Technical Specification</u>

Since the proposed Technical Specifications for fuel assembly positioning are more restrictive than the current license requirements, the existing fuel pool inventory will need to be re-configured prior to implementing the license amendment. The contents of each SFP rack module will be designated to correspond to an allowable fuel storage pattern per the proposed Technical Specification. Any fuel moves made prior to approval of the proposed amendment will comply with existing Technical Specifications. Any fuel moves that do not comply with existing Technical Specifications will be deferred to the interim period between amendment approval and amendment implementation. At a time after the spent fuel pool is verified to be in its conforming configuration, FPL will notify NRC that the new Technical Specifications have been implemented.

For example, implementation of Pattern D, which is the pattern crediting the presence of full strength CEAs, will be performed by repositioning fuel and CEAs based on a

documented move list developed in advance of the move campaign. This move list will be the product of an engineering document that includes an independent verification of the proposed position of each assembly and CEA to ensure that placement will satisfy the proposed module designation.

Implementation of Pattern D will be a two-step process. The first step is a CEA shuffle that will place CEAs into the required assemblies prior to any fuel movement. The second step would move the fuel assemblies selected for Pattern D, some of which now contain CEAs, into their specified locations in a particular SFP storage module, thereby forming the pattern. Each movement of CEAs or fuel assemblies in this process will be controlled by an appropriate plant document. In addition, the location of all assemblies and inserts (CEAs) would be verified after completion of the re-configuration campaign. This process, with its controls and checks, will assure that the initial implementation of Pattern D meets all requirements. This sequencing may be performed under the current Technical Specifications prior to implementation of the proposed amendment, because current fuel pool storage-related Technical Specifications have no requirements that constrain CEA positioning.

Movement of CEAs after reconfiguration

After the initial re-configuration, any subsequent movement of fuel assemblies containing CEAs will be controlled. These controls require independent verification of each planned move to ensure that assembly and CEA placement is consistent with Technical Specification requirements. Procedures also require validation of each physical move against the verified move list.

It should be noted that for any fuel storage location requiring a CEA while fuel is present, removal of the fuel assembly and CEA from that location will be accomplished together, i.e., with the CEA inserted. There is no need for, and procedural guidance would not permit, removal of the CEA prior to fuel assembly movement. Additionally, the placement of a fuel assembly into a location requiring a CEA would be permitted only if a CEA had already been inserted into the assembly prior to placement.

Handling CEAs alone (not as part of a fuel assembly move)

Manipulation of CEAs at St. Lucie Unit 1 requires the use of a special CEA Handling Tool whose geometry, grapple, and other physical characteristics ensure it will not be confused with the tool used to manipulate and reposition fuel assemblies. The tool used to grapple and manipulate fuel assemblies, i.e., the spent fuel handling tool, is not designed and is not used to grapple or manipulate CEAs. Load cell circuitry installed in the spent fuel

handling machine enables the operator, via a local display, to monitor the weight of fuel assemblies during hoisting and placement operations and provides a positive means of ensuring that CEAs are not inadvertently snagged during the grappling and un-grappling process. Therefore, inadvertent operator action to remove a CEA from a fuel assembly is not postulated.

Procedures control use of the CEA Handling Tool. Procedures also require a significant checkout of the tool prior to use to ensure it will function correctly. It is therefore very clear to the involved personnel that a CEA shuffle is being undertaken. It is not credible to envision plant operators intending to move a fuel assembly containing a CEA and instead inadvertently using the CEA Handling Tool to remove only the CEA.

On this basis, the design and use of the CEA handling tool meets the intent of RG 1.13 to use fixed absorbers that are designed and fabricated so as to preclude inadvertent removal by mechanical action. Any CEA movement using the CEA handling tool would require deliberate action by the operator.

CEA Integrity in Response to Chemical Action

The water chemistry conditions present in the fuel pool and the spent fuel storage racks will not cause degradation of the CEA cladding. CEAs are designed and manufactured so that the welded cladding is impervious to the water and boric acid environment found in the core and in the fuel pool. This impervious cladding protects the integrity of each finger's absorber pellets.

Updated FSAR Section 4.2.3.2.3c, Control Element Assembly Design Evaluation – CEA Material Selection, notes that the cladding tube, upper end fitting and end cap are made of a Ni-Cr-Fe 625 alloy. This material was selected because of its high strength, corrosion resistance, and dimensional stability under irradiation. As noted in the response to Question 2, a conservative value of CEA lifetime has been established, based on analysis as well as an extensive in-pool measurement and inspection campaign involving irradiated CEAs. This lifetime provides assurance that CEA cladding is intact at the end of its in-core duty cycle. As the response to Question 2 also notes, any CEA found to have cracked cladding would not be credited for reactivity hold down in the Unit 1 fuel storage racks.

Summary

In summary, the use of CEAs at St. Lucie as neutron absorbers in the Spent Fuel Pool is acceptable because:

a) The CEA's presence in the assembly is confirmed when originally placed, and

b) The CEA is maintained in the assembly unless deliberate action is taken, i.e., removal using the CEA Handling Tool. Inadvertent CEA removal is not postulated because of the handling tool design, procedural controls, and operator awareness prior to handling tool operation.

4. The licensee stated, in its original amendment request, that it analyzed the misplacement of a fresh fuel assembly in a cell intended to hold a low-reactivity assembly (Case 4, assembly with CEA). However, the licensee stated this was not the bounding misloading event. Provide the following information regarding loading and storage of fuel in the Case 4 configuration, which credits the presence of CEAs:

   1. Provide detailed information describing the loading and unloading procedures for movement of fuel assemblies and CEAs into Case 4 storage patterns. Specifically, the response should focus on the procedural controls that will be used to ensure the Case 4 pattern is not violated, even for brief periods of time, while fuel movement is occurring.

   2. Submit the results of the misloading event analysis for Case 4, assembly without a CEA configuration. The licensee should provide the following: (1) a detailed description of the assumptions used in the analysis, (2) the basis for each assumption and why it results in conservative or bounding results, (3) the acceptance criteria the licensee evaluated the event against, including a justification for the criteria chosen, (4) a description of the methodology employed to perform the analysis, and (5) a detailed discussion of the results obtained, including a justification for why the results provide a conservative or bounding analysis.

   3. The NRC staff has been unable to identify any precedents for crediting CEAs or other nonfixed neutron absorbers in an SFP criticality analysis. Provide additional information on any previous NRC-approved amendments related to this subject.

<u>Response</u>:

<u>Item 1</u>:

The response to Question 3 provides a description of the process to be used to position fuel assemblies with CEAs into a Case 4 storage pattern. To prevent violating storage pattern requirements, even for a brief period, controls on SFP fuel movement will ensure that a fuel assembly is placed into a location requiring a CEA only if it already has a CEA inserted. These same controls, and the unique tooling required to manipulate fuel inserts, ensure that no CEA is inadvertently removed from a fuel storage location where a CEA is required to be present. All the requirements of Case 4, including fuel burnup/enrichment limits and, where necessary, the presence of a full-strength CEA, will be met when fuel is placed in this array. The process used to control fuel movement at the plant requires an

independent verification of each prospective move in the Spent Fuel Pool to ensure that no violation of the fuel pattern requirements will occur.

Item 2:

The bounding misloading event analyzed for this submittal assumed a fresh 4.5 w/o U-235 fuel assembly was placed between two other fresh assemblies in a Region 2 rack (a contingency for Patterns C or E in proposed Technical Specification Figure 5.6-2). None of the three adjacent fresh assemblies contained a CEA. The analysis concluded that a soluble boron concentration of 1090 ppm is necessary to ensure k_{eff} remains less than or equal to 0.95 for this event.

A separate misloading event was evaluated for a Case 4 [Pattern D] configuration to determine the soluble boron requirement associated with the placement of a fresh assembly, not containing a CEA, in a location where a fuel assembly with a CEA would be required. This misload event is the limiting misload for the Case 4 pattern. Similar to the bounding misload for the submittal, soluble boron is also credited during this event under the double contingency principle; that is, the misload is not evaluated under boron dilution conditions. The calculation was designed to determine the minimum soluble boron concentration necessary to maintain k_{eff} of the mis-loaded array less than 0.95.

The calculation model utilized for this evaluation is similar to that presented in Figure 4.6.7 of the licensing report. That is, a 10 x 10 array with reflective boundary conditions was developed for MCNP in which all assemblies were correctly placed into a Case 4 configuration with the exception of one assembly. In place of a burned assembly with a CEA, a fresh assembly, containing no CEA and enriched to 4.5 w/o U-235, was inserted into the checkerboard pattern.

The analysis assumptions used in this misload evaluation are basically the same as for other Case 4 calculations, with the exception of the geometry model and the presence of soluble boron. For the burned fuel in the Case 4 array, the core operating parameters used for the depletion analyses were chosen to maximize the reactivity of the fuel. The bounding fuel assembly type for Region 2, the CE 14x14 assembly type, was used in this analysis. The worst-case tolerances for this fuel, including tolerances associated with CEAs, are used in determining the soluble boron requirement. A temperature correction is applied to adjust the MCNP calculated k_{eff} for pool water temperature effects. The temperature effect was calculated as a function of soluble boron to maximize the correction.

The calculation determined that a soluble boron concentration of 965 ppm was required to maintain a k_{eff} of 0.945. Therefore, this misload scenario is less restrictive than the bounding misload event documented in the licensing report. As noted earlier, the bounding misload event required 1090 ppm boron to maintain k_{eff} less than or equal to 0.95.

Item 3:

St. Lucie Unit 2 credited control rods (CEAs) for reactivity hold-down in spent fuel storage racks in an amendment approved by an NRC SER dated May 6, 1999. In addition, neutron absorbing poison rodlets were approved for Millstone Unit 2 spent fuel storage March 1, 1994 (Amendment No. 172).

5. Since the licensee's criticality analyses are based on worst-case tolerance limits that are dependent on quality control measures instead of statistical uncertainties that use actual sample data to develop limits, provide a detailed description of the quality control measures in place that ensure all of the limits used in criticality analyses will be met.

Response:

Quality control measures in place to ensure that the worst-case tolerance limits used in the criticality analyses will not be exceeded are an integral part of the Appendix B quality assurance programs for the storage rack and nuclear fuel vendors.

Rack tolerance parameters utilized in the St. Lucie Unit 1 criticality analysis crediting soluble boron were extracted from the approved design drawings developed for Region 1 and Region 2 storage racks installed in the spent fuel pool. These racks were designed and fabricated under the requirements of an Appendix B Quality Assurance program and were installed at St. Lucie Unit 1 during the late 1980s.

Prior to initiating work on this criticality analysis, FPL asked each supplier of nuclear fuel at the St. Lucie site to identify and independently verify nominal values, as well as maximum and minimum values of a variety of fuel parameters, relevant to analyses, for each reload batch where fuel was supplied. Parameter values that bounded all reload batches of a given supplier's fuel were subsequently used as verified input to this criticality analysis. As a result, criticality analysis input parameters contain a small amount of recoverable margin that may be used in the future to accommodate any unforeseen deviations.

Fuel Assemblies used at St. Lucie Unit 1 have been, and continue to be, fabricated under the requirements of an Appendix B Quality Assurance program. Fuel assemblies fabricated for Unit 1 in the future will be required to conform with or be bounded by the design characteristics assumed in criticality analyses. A certification is provided for each fuel reload that the fuel assemblies comprising that reload batch have been fabricated in accordance with specifications. Non-conformance with product specifications is brought to the attention of the purchaser (normally FPL); these items must be satisfactorily dispositioned prior to fuel receipt.