Duke Energy®

DAVE BAXTER
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August 1, 2008

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Site, Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287
License Amendment Request for Approval to Mitigate Alloy 600 Concerns in the Oconee Pressurizer
License Amendment Request (LAR) No. 2008-08

In accordance with 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke) proposes to amend the licensing basis for Renewed Facility Operating Licenses Nos. DPR-38, DPR-47, and DPR-55. This LAR requests the Nuclear Regulatory Commission (NRC) to review and approve a design change that serves to mitigate Alloy 600 concerns in the Oconee Unit 2 Pressurizer. In concert with this change is a revision to Section 5.2.3.2 of the Updated Final Safety Analysis Report (UFSAR) to account for small areas of carbon steel and low alloy steel that may be exposed to the reactor coolant system.

The design change replaces a Pressurizer vent and thermowell with Primary Water Stress Corrosion Cracking (PWSCC) resistant materials. Due to their materials of construction (Alloy 600), geometry (internal J-groove weld), and environment (650F nominal temperature), the Pressurizer vent and thermowell components were identified early in the ONS Alloy 600 Program as components with the highest risk for PWSCC.

This change has been installed on Units 1 and 3. It was only during the third implementation of this design change that it was determined that calculations in support of this activity could be viewed as a change in methodology. Therefore, the UFSAR, as submitted, also serves to document the as-built condition of Units 1 and 3. The implementation of the Units 1 and 3 design changes without prior NRC approval has been entered into the corrective action program.

In accordance with Duke administrative procedures and the Quality Assurance Program Topical Report, these proposed changes have been reviewed and approved by the Plant Operations Review Committee and Nuclear Safety Review Board. Additionally, a copy of this LAR is being sent to the State of South Carolina in accordance with 10 CFR 50.91 requirements.

A001
NRR

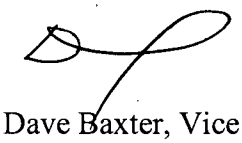
Approval of the proposed amendment is requested by October 25, 2008 to support the Unit 2 fall refueling outage. Duke will implement the amendment immediately upon receipt of NRC approval.

Proposed changes to applicable sections of the Oconee UFSAR are provided in Attachment 1.

There are no commitments associated with this request.

Inquiries on this proposed amendment request should be directed to Sandra Severance of the Oconee Regulatory Compliance Group at (864) 885-3466.

Sincerely,



Dave Baxter, Vice President
Oconee Nuclear Site

Enclosures:
1. Notarized Affidavit
2. Evaluation of Proposed Change

Attachments:
1. UFSAR – Mark Ups
2. ONS Reference Drawings - FOR INFORMATION ONLY
   OM 201-3232.001, Rev 0, ONS1, 2 & 3 Vent Nozzle Modification
   OM 2201-3212.001, Rev D01, ONS3 1.5 Pressurizer Thermowell Repair Design
   OM 2201-3220.001, Rev D03, ONS3 Thermowell, Pressurizer

bc w/enclosures and attachments:

Mr. Luis Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
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Senior Resident Inspector
Oconee Nuclear Site

Mrs. Susan Jenkins, Manager
Infectious and Radioactive Waste Management Section
Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

ENCLOSURE 1

NOTARIZED AFFIDAVIT

AFFIDAVIT

Dave Baxter, being duly sworn, states that he is Vice President, Oconee Nuclear Site, Duke Energy Carolinas, LLC that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this revision to the Renewed Facility Operating License Nos. DPR-38, DPR-47, and DPR-55; and that all statements and matters set forth herein are true and correct to the best of his knowledge.

Dave Baxter, Vice President
Oconee Nuclear Site

Subscribed and sworn to before me this 1st day of August, 2008

Notary Public

My Commission Expires:

6-12-2013
Date

SEAL

ENCLOSURE 2

EVALUATION OF PROPOSED CHANGE

Subject: License Amendment Request for Approval to Mitigate Alloy 600 Concerns in the Oconee Pressurizer
License Amendment Request No. 2008-08

1.0 SUMMARY DESCRIPTION

This License Amendment Request (LAR) requests review and approval of a revision to the Oconee Nuclear Station (ONS) Updated Final Safety Analysis Report (UFSAR) Section 5.2.3.2 to reflect pending and as-built changes due to Alloy 600 mitigation activities for components of the ONS Units 1, 2, and 3 Pressurizers. Section 5.2.3.2 of the ONS UFSAR describes the materials selected for the ONS Reactor Coolant System (RCS). It states that these materials were chosen for their corrosion resistant properties for the expected service conditions. As part of the ongoing mitigation of Alloy 600 components within the RCS, a mitigation technique was selected for the Pressurizer thermowell and vent nozzle which exposes small areas of carbon steel (CS) to the RCS environment. The current UFSAR terminology implies that no corrosion evaluation is required because the materials were selected for their corrosion resistant properties. The Unit 2 design change exposes CS and includes a corrosion evaluation. The inclusion of a corrosion evaluation was conservatively characterized as a methodology change during the 10 CFR 50.59 process.

It was during the preparation of the Unit 2 design change package that the need for prior NRC approval was first identified. This same work was previously completed on Units 1 and 3 without prior NRC approval. A cause investigation into this difference substantiated that there were no technical concerns with the package and its installation. The reviewer for the 10 CFR 50.59 evaluation for the Unit 2 design change package concluded that inclusion of a corrosion evaluation where none previously existed constitutes a methodology change requiring prior NRC approval. This reviewer was not involved in the Unit 1 or Unit 3 changes. This conclusion is considered to be conservative; however, per 10 CFR 50.59, NRC approval is being sought for the change.

In summary, the method chosen to alleviate Alloy 600 concerns for the Pressurizer thermowell and vent nozzles will allow a small portion of the Pressurizer CS to be exposed to stagnant RCS water. We request NRC approval of the design change and accompanying UFSAR revision.

2.0 DETAILED DESCRIPTION

This proposed amendment updates the current wording in ONS UFSAR Section 5.2.3.2 to reflect as-built and pending design changes as a result of Alloy 600 component mitigation actions. The first two paragraphs in the updated UFSAR Section 5.2.3.2 will be changed as detailed in Attachment 1.

Section 5.2.3.2 of the ONS UFSAR describes the materials selected for the RCS. It states that these materials were chosen for their corrosion resistant properties for the expected service conditions. This statement has remained unchanged within the Final Safety Analysis Report (FSAR) as far back as Revision 5 (dated 5/25/1970), where it was located in Section 4.3.2 under the old FSAR format. As part of the ongoing mitigation of Alloy 600 components within the RCS, a mitigation technique was selected for the Pressurizer vent nozzle and the Pressurizer thermowell which exposes a small area of CS to a stagnant RCS environment. As required by the ASME Code (Reference 6.1), a supporting corrosion evaluation was developed within each of the two component designs.

As a result of a recent 10 CFR 50.59 Evaluation performed for Design Change OD201682 (replacement of the ONS Unit 2 Pressurizer thermowell and vent nozzle), the conclusion was reached that the design change should receive prior NRC approval. This conclusion was based on the current wording in UFSAR Section 5.2.3.2, Materials Selection, which states:

"All Reactor Coolant System materials normally exposed to the coolant are corrosion-resistant materials consisting of 304 or 316 stainless steel, Inconel, Alloy 690 TT, 17-4PH (H1100), Zircaloy, or weld deposits with corrosion resistant properties equivalent to or better than those of 304 SS. These materials were chosen for specific uses at various locations within the system because of their compatibility with the reactor coolant."

As mentioned previously, the 10 CFR 50.59 Evaluation of the ONS Unit 2 design change, currently scheduled for implementation during the fall 2008 refueling outage, determined that the current UFSAR statement implies that no corrosion evaluations are required because the materials were selected for their corrosion resistant properties. Therefore, implementing a design change that exposes carbon steel (CS) or low alloy steel (LAS) and includes a corrosion evaluation for the design is a "methodology change", as Question 8 of the 10 CFR 50.59 Evaluation asks: "Does the proposed activity result in a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses?" Answering YES to question 8 requires prior NRC approval for the design change.

Therefore this LAR contains a discussion of ONS's supporting corrosion evaluations for NRC review and approval, using the Alloy 600 component replacements as an example. These evaluations also support the ONS request to change the UFSAR wording in Section 5.2.3.2 to support the acceptability of small exposed areas of low alloy or carbon steel in the RCS. The existing UFSAR Section 5.2.3.2 statement has remained

unchanged in the UFSAR since at least 1970. There has been no prior communication or correspondence with the NRC on this topic.

3.0 TECHNICAL EVALUATION

Each of the original Unit 1, 2, and 3 Pressurizers contain nine small bore Alloy 600 (SB 166) components and their attachment butt welds, including the Pressurizer steam space vent nozzle, the six level and single sample tap safe ends, and the water space thermowell. Due to Primary Water Stress Corrosion Cracking (PWSCC) concerns for these small bore Alloy 600 components and past Alloy 600 operational experience at other utilities, the replacement of these components was considered to be a priority for ONS. Therefore, starting in early 2005, ONS contracted with outside vendors to provide new component designs to replace these Alloy 600 components with PWSCC resistant materials.

Vent Nozzle Technical Evaluation

An outside vendor was contracted for the Pressurizer vent nozzle component replacement. The design was based on a half-nozzle replacement, where the existing Alloy 600 vent nozzle is severed mid-wall in the Pressurizer head. The nozzle hole is then over-bored to accept a new stainless steel vent nozzle, and an external weld pad is welded to the Pressurizer head to form the new pressure boundary weld. The drawing of this replacement design is included in Attachment 2. The new stainless steel vent nozzle is welded to the external weld pad, maintaining a 1/16" minimum gap between the bottom of the new nozzle and the top of the old nozzle remnant, thereby allowing the Pressurizer steam environment to enter the gap between the new vent nozzle, the existing vent nozzle remnant, and the bored hole in the Pressurizer head. The vent nozzle remnant and the existing J-groove weld remain attached to the Pressurizer head inside surface. This change was implemented during refueling outage 3EOC22 in the spring of 2006 for ONS Unit 3 and in the fall of 2006 during 1EOC23 for ONS Unit 1. This change is planned for implementation in the fall of 2008 for ONS Unit 2. The Unit 1 and 3 component replacements occurring without NRC prior approval has been entered into the corrective action program, and a cause evaluation has been performed.

The replacement Pressurizer vent nozzle leaves a small area of the Pressurizer head CS exposed to the Pressurizer steam space environment. The Unit 1 head material is SA212, Grade B and the Unit 2 and 3 material is SA516, Grade 70. The exposed area is of a cylindrical geometry, with a 1.65" diameter over the outermost 1.5" and a 1.45" diameter over the remaining inner 2.75" of Pressurizer head thickness, resulting in an exposed CS area on the order of 20 sq in. The new stainless steel vent nozzle is designed to have a

0.010" radial gap between the new nozzle and Pressurizer head bore diameter (Attachment 2). The original Alloy 600 vent nozzle was designed for a 0.010" radial gap between the existing nozzle and the Pressurizer head bore diameter.

Thermowell Technical Evaluation

A second, independent firm was contracted for the Pressurizer thermowell component replacement. The design removes the existing thermowell and a portion of the J-groove attachment weld with a combination of mechanical boring and Electro Discharge Machining (EDM) to reduce the potential for foreign material introduction into the Pressurizer. An external weld pad is welded to the outside surface of the Pressurizer shell to form the new pressure boundary weld and a new Alloy 690 thermowell is inserted and welded to the external weld pad, thereby allowing the Pressurizer water space environment to enter the gap between the new thermowell and the Pressurizer shell bore. This design change was implemented in the fall of 2006 for ONS Unit 1 and the fall of 2007 for ONS Unit 3. This change is planned for implementation in the fall of 2008 for ONS Unit 2. The Unit 1 and 3 component replacements occurring without NRC prior approval has been entered into the corrective action program, and a cause evaluation has been performed.

The replacement Pressurizer thermowell leaves a small area of the Pressurizer shell CS exposed to the Pressurizer water space environment. The ONS Unit 1 shell material is SA212, Grade B and the ONS Unit 2 and 3 material is SA516, Grade 70. The exposed area is of a cylindrical geometry, with a 1.510" maximum diameter through the 6.188" Pressurizer shell thickness, resulting in an exposed area on the order of 30 sq in. The new Alloy 690 thermowell has a 1.493" to 1.498" outside diameter, so the radial gap between the new nozzle and Pressurizer head bore diameter is a maximum of 0.0085".

Proposed changes to the Section 5.2.3.2 of the ONS UFSAR are based on exposing materials as part of Alloy 600 component mitigation and updating the effect this exposure has on the design life of the affected components.

The corrosion evaluations for each of the Pressurizer vent and thermowell designs meet the requirements of the ASME Code, Section III, Subsection NB, Subparagraph NB-3121, which states that corrosion effects must be considered in the design. Each of these corrosion evaluations was documented in the individual components' supporting design calculations. Corrosion rates were taken from appropriate, available Electric Power Research Institute (EPRI) and generally available industry standards (see References 6.3, 6.4, and 6.5). Similar corrosion rates for similar materials were reviewed and accepted by

the NRC in an SER dated 11/15/07 (Reference 6.2). No proprietary vendor sources were used in the development of either of the corrosion evaluations.

Vent Nozzle Summary Information

The corrosion evaluation for the Pressurizer vent nozzle is documented in a calculation. Based on extensive experimental test data and power operating data, the evaluation determined that a 0.001 inch/year long term corrosion rate for stagnant locations such as the exposed CS due to the Pressurizer vent nozzle repair was appropriate for operating conditions and a 0.009 inch/year corrosion rate was appropriate for shutdown conditions. These values were used in an 18 month operating and 2 month shutdown cycle, resulting in a conservative general long term corrosion rate of 0.0018 inches per year and the conclusion that the long term corrosion rate and the overall release of iron into the RCS is expected to be negligible during the 60 year replacement vent nozzle component design life.

Thermowell Summary Information

The corrosion evaluation for the Pressurizer thermowell is documented in a calculation. Based on several corrosion rate references, the evaluation determined that a 0.0006 inch/year corrosion rate was appropriate for high temperatures during 85% of an operating year, 0.0022 inch/year at intermediate temperatures during 5% of the operating year, and a 0.008 inch/year corrosion rate was appropriate for shutdown conditions during the remaining 10% of the year. These values were used together, resulting in a conservative general corrosion rate of 0.00142 inches per year and the conclusion that this total general corrosion rate is not considered significant during the 60 year replacement thermowell component design life.

The conservative corrosion rates developed within both the corrosion calculations are considered to be 'negligible' or 'not significant', and therefore are acceptable for the specific Pressurizer vent and Pressurizer thermowell design applications. Similar corrosion rates for similar materials were reviewed and accepted by the NRC in an SER dated 11/15/07 (Reference 6.2). These expected extremely low rates of material loss and iron release rates will provide an acceptable level of safety.

No similar ONS design changes have been previously reviewed by the NRC. However, other Utilities have implemented similar Alloy 600 component mitigation strategies, and these changes were reviewed by the NRC as part of their Relief Request submittals. One example is Crystal River 3's Resubmittal of Relief Requests #07-001-RR, Rev 0 and #07-002-RR, Rev 0 (CR-3 Letter 3F0407-15, dated April 12, 2007). A corrosion evaluation

summary was included for completeness on page 13 of Attachment B (Relief Request #07-001-RR, Rev 0) in paragraph 2.g. The corrosion evaluation in the CR-3 document contains a similar level of detail as presented here, as well as providing an identical conclusion as to the significance of the corrosion that would be introduced by the implementation of these Alloy 600 mitigation techniques. Reference 6.2 is the NRC Safety Evaluation for the CR-3 Request for Relief.

Corrosion evaluations were performed as part of the Alloy 600 component replacement design for the Pressurizer vent nozzle and the thermowell connection. These evaluations met all ASME Code requirements. Supporting corrosion rates for the specific designs were taken from standard, non-proprietary industry sources (References 6.3, 6.4, and 6.5). The resulting corrosion rates are considered 'negligible' and 'not significant', respectively for the vent and thermowell replacement designs. The corrosion rates are acceptable for the replacement component design life and will provide an acceptable level of safety.

4.0 REGULATORY EVALUATION

4.1 Significant Hazards Consideration

Duke Energy Carolinas, LLC, has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1) Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   No.

   The Pressurizer vent nozzle and thermowell, as components of the RCS, must maintain system pressure boundary. RCS design pressure is 2500 psig and design temperature is 670°F. The vent nozzle and thermowell replacements are designed for the RCS pressure and temperature. As described above, the material of the new Pressurizer vent nozzle and thermowell is an improvement in the PWSCC resistance of those components as compared to the original components. The design of the new Pressurizer vent nozzle and thermowell exposes small areas of the Pressurizer shell carbon steel to a stagnant reactor coolant environment. However, the corrosion of the Pressurizer shell is considered negligible. Therefore, the replacement of the Pressurizer vent nozzle and thermowell do not more than minimally increase the likelihood of occurrence of a malfunction. Corrosion evaluations performed show

that all applicable ASME Code requirements are met.

It is concluded that the consequences of a Pressurizer vent nozzle or Pressurizer thermowell failure resulting in a LOCA are bounded by existing analysis. Therefore, there is no increase in the probability or consequences of an accident.

2) Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

No.

The only credible accident involving the failure of these components is bounded by existing LOCA analyses. There are no new accidents that need to be postulated due to the replacement of the Pressurizer vent nozzle and Pressurizer thermowell. Therefore, this proposed activity will not create the possibility of a new or different kind of accident from any kind of accident previously evaluated.

3) Does the proposed amendment involve a significant reduction in a margin of safety?

No.

The mitigation technique selected for the Pressurizer vent nozzle and the Pressurizer thermowell exposes a small area of CS to the RCS environment. As required by the ASME Code, Section III, a supporting corrosion evaluation was developed within each of the two component designs. The technical package for the replacement of the Pressurizer vent nozzle and the Pressurizer thermowell utilized calculations to support the evaluation of the acceptability of this repair/replacement activity. The corrosion evaluation for the Pressurizer vent resulted in a conservative general stagnant corrosion rate of 0.0018 inches per year and the corrosion evaluation for the Pressurizer thermowell resulted in a conservative general corrosion rate of 0.00142 inches per year. The critical corrosion distance is the radius from the exposed CS surface to the edge of the weld pad. This distance is at least 1.1 inches for both the vent and thermowell designs. With this distance, a corrosion rate of less than 2 mils per year is not significant when compared to the 60 year component design life, which begins at the time of installation.

The original Pressurizer was designed to meet Section III of the ASME Code, and the Pressurizer, as modified, meets Section III of the ASME code. Although this change does expose small areas of CS in the Pressurizer, the change does not involve

a significant reduction in a margin of safety.

4.2 Applicable Regulatory Requirements/Criteria

The NRC regulations related to the creation and maintenance of the Final Safety Analysis Report are contained in 10 CFR 50.34 and 10 CFR 50.71. Following implementation of the changes proposed in this LAR, the UFSAR will continue to comply with these regulations. Duke has evaluated the proposed changes to UFSAR 5.2.3.2 as discussed above, and has determined that these are appropriate for implementation at the Oconee Nuclear Station.

4.3 Precedent

No similar ONS design changes have been previously reviewed by the NRC. However other Utilities have implemented similar Alloy 600 component mitigation strategies and these changes were reviewed by the NRC as part of the other Utilities' Relief Request submittals. One example is Crystal River 3's Resubmittal of Relief Requests #07-001-RR, Rev 0 and #07-002-RR, Rev 0 (CR-3 Letter 3F0407-15, dated April 12, 2007). A corrosion evaluation summary was included for completeness on page 13 of Attachment B (Relief Request #07-001-RR, Rev 0) in paragraph 2.g. The corrosion evaluation in the CR-3 document contains a similar level of detail as presented here, as well as providing an identical conclusion as to the significance of the corrosion that would be introduced by the implementation of these Alloy 600 mitigation techniques. Reference 6.2 is the NRC Safety Evaluation for the CR-3 Relief Request.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

Duke Energy Carolinas, LLC, has evaluated this license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. Duke has determined that this license

amendment request meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or that changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria.

(i) The amendment involves no significant hazards consideration.

As demonstrated in Section 4.1, this proposed amendment does not involve significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

The replacement of the pressurizer vent nozzle and thermowell will not impact effluents released offsite. Therefore, there will be no significant change in the types or significant increase in the amounts of any effluents released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

This change will not impact occupational radiation exposure. Therefore, there will be no significant increase in individual or cumulative occupational radiation exposure resulting from this.

6.0 REFERENCES

6.1 ASME Code, Section III, 1983 and 1989 Editions
6.2 Safety Evaluation by the Office of NRR, CR-3 FPC Docket 50-302, 11/15/07.
6.3 "Boric Acid Corrosion Guidebook", Rev 1, EPRI TR-1000975.
6.4 "Evaluation of Yankee Vessel Cladding Penetrations", WCAP-2855.
6.5 "Low Alloy Steel Component Corrosion Analysis Supporting Small-Diameter Alloy 600/690 Nozzle Repair/Replacement Program", WCAP-15973-NP, Rev 1.

ATTACHMENT 1

UFSAR MARK UP

5.2.3.2 Material Selection

Each of the materials used in the Reactor Coolant System has been selected for the expected environment and service conditions. The major component materials are listed in Table 5-5. ~~All~~ Reactor Coolant System materials normally exposed to the reactor coolant are mainly corrosion-resistant materials consisting of 304 or 316 stainless steel, Inconel, Alloy 600, Alloy 690 ~~TT~~, 17-4PH (H1100), Zircaloy, or weld deposits with corrosion-resistant properties equivalent to or better than those of 304 SS. These materials were chosen for specific uses at various locations within the system because of their compatibility with the reactor coolant. The original corrosion resistant materials are supplemented through repair/replacement activities by materials (e.g., Alloy 690) which are considered to provide improved corrosion resistance. There are no novel material applications in the Reactor Coolant System.

In some specific locations of the Reactor Coolant System, small areas of Low Alloy Steel (LAS) or Carbon Steel (CS) may be exposed to the reactor coolant as a result of RCS component modifications. In each case, a corrosion evaluation was performed demonstrating the component meets the appropriate design Code requirements for the duration of its service life. Two examples are the mitigation of the Alloy 600 Pressurizer thermowell and the Alloy 600 Pressurizer 1 inch vent nozzle components. Small areas of CS were exposed in the annulus region between the replacement Stainless Steel vent nozzle and the Pressurizer Head (less than 22 sq in), as well as the replacement Alloy 690 thermowell and the Pressurizer shell (less than 30 sq in). For each design, a corrosion evaluation was performed as documented in a calculation (Reference "x") and ONS License Amendment Request (Reference "y"). This was approved by the NRC in their Safety Evaluation Report (Reference "z").

To assure long steam generator tube lifetime, feedwater quality entering the steam generator is maintained as high as practical. The current revision of the SGOG EPRI PWR Secondary Chemistry Guidelines and vendor recommendations are used to prepare operating specifications which are addressed in the Chemistry Section Manual.

[THE REMAINDER OF THIS SECTION REMAINS UNCHANGED.]

ATTACHMENT 2

OCONEE REFERENCE DRAWINGS

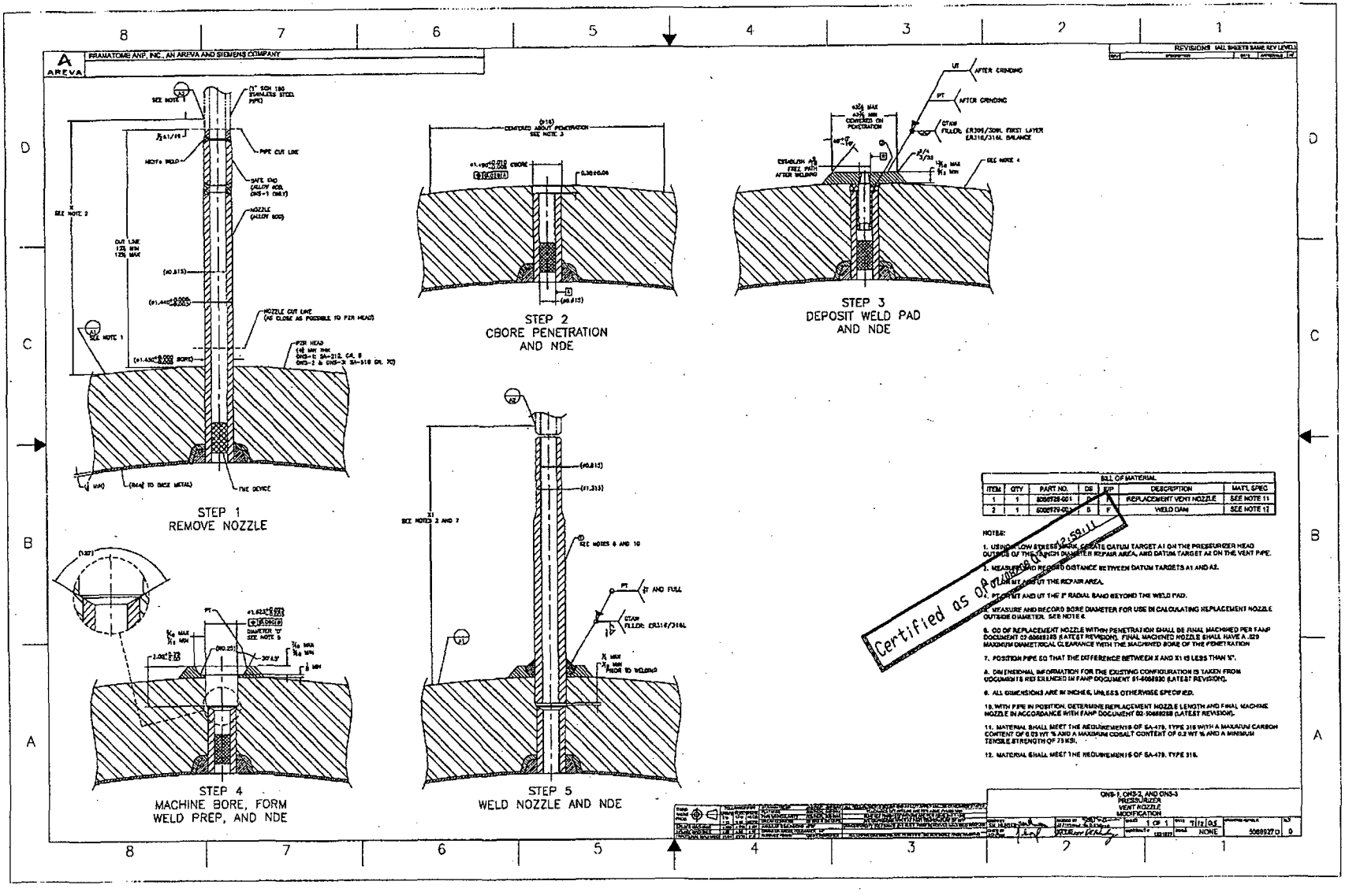
OM 201-3232.001, Rev 0, ONS1, 2 & 3 Vent Nozzle Modification

OM 2201-3212.001, Rev D01, ONS3 1.5" Pressurizer Thermowell Repair Design

OM 2201-3220 001, Rev D03, ONS3 Thermowell, Pressurizer

FOR INFORMATION ONLY

The following drawings are attached only to assist in the review process.



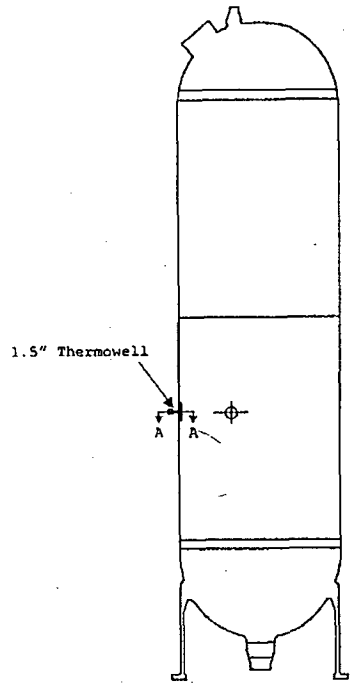
Attachment 2 to LAR 2008-08

OM 201.-3232.001

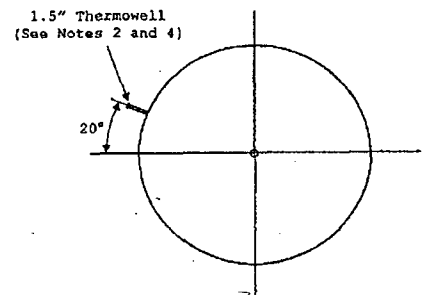
QA CONDITION 1

STATUS	ND.	REVISIONS	DRN	DATE	CHKD	DATE	APPR	DATE	INSPECTED
A	0	VENDOR ISSUED PER QE600497					ROD	3-15-06	OWP -W- JAS - (CIVIL, ELEC., MECH., OTHER)

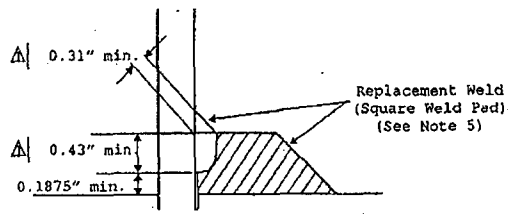
ERN: 0X009IZ6



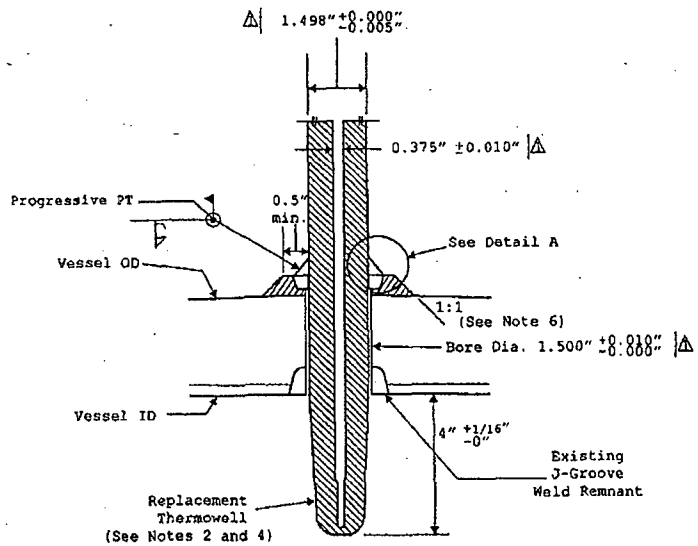
ELEVATION
(Thermowell Location)



TOP VIEW
(Thermowell Location)



DETAIL A



SECTION A-A
(Rotated 90°)

Notes:
1. Break all sharp corners to leave a smooth transition.
2. Replacement thermowell is Alloy 690 material.
3. Replacement weld metal is Alloy 52M/152M.
4. Replacement thermowell dimensions per WSI Drawing No. 401795, Revision 2.
5. There is no requirement as to the radius of the replacement weld connecting the pad to the replacement thermowell.
6. The slope of the replacement weld shown is a maximum slope. Other slopes, such as 1:3, where the first dimension is the pad thickness, are acceptable.
7. Maximum diametrical gap is 0.020".
8. Duke Purchase Order No. DS 2058.

Rev.	Date	Drawn By	Checked By	Engineer	Approved By
1	09/06/06	A. Vanichsarn	R. Mattson	G. Mukhim	M. Taylor

Structural Integrity Associates, Inc.

TITLE
Pressurizer 1.5" Thermowell
Repair Design

Oconee Nuclear Station, Unit 3

D01

Drawn by: A. Vanichsarn	Date: 08/08/06	DRAWING NO. ONS-15Q-05	PROJECT NO. ONS-15Q
Checked by: R. Mattson	Date: 08/08/06	NUCLEAR SAFETY RELATED YES [X] NO [ ]	FILE NO. ONS-15Q-550
Engineer: G. Mukhim	Date: 08/08/06	CODE: ASME, III, NB	SCALE: None / SHEET: 1 of 1 / REV: 1
Approved by: M. Taylor	Date: 08/08/06		

OM 2201.-3212.001

QA CONDITION 1

STATUS	NO.	REVISIONS	ORN	DATE	CHKD	DATE	APPR	DATE	CIVIL	ELEC.	MECH.	CHEM. INSPECTED
A	D01	REVISED PER 00381377	FWP	1/9/08	LSW	1/9/08	DAK	1/15/08	-W-	-W-	-W-	---

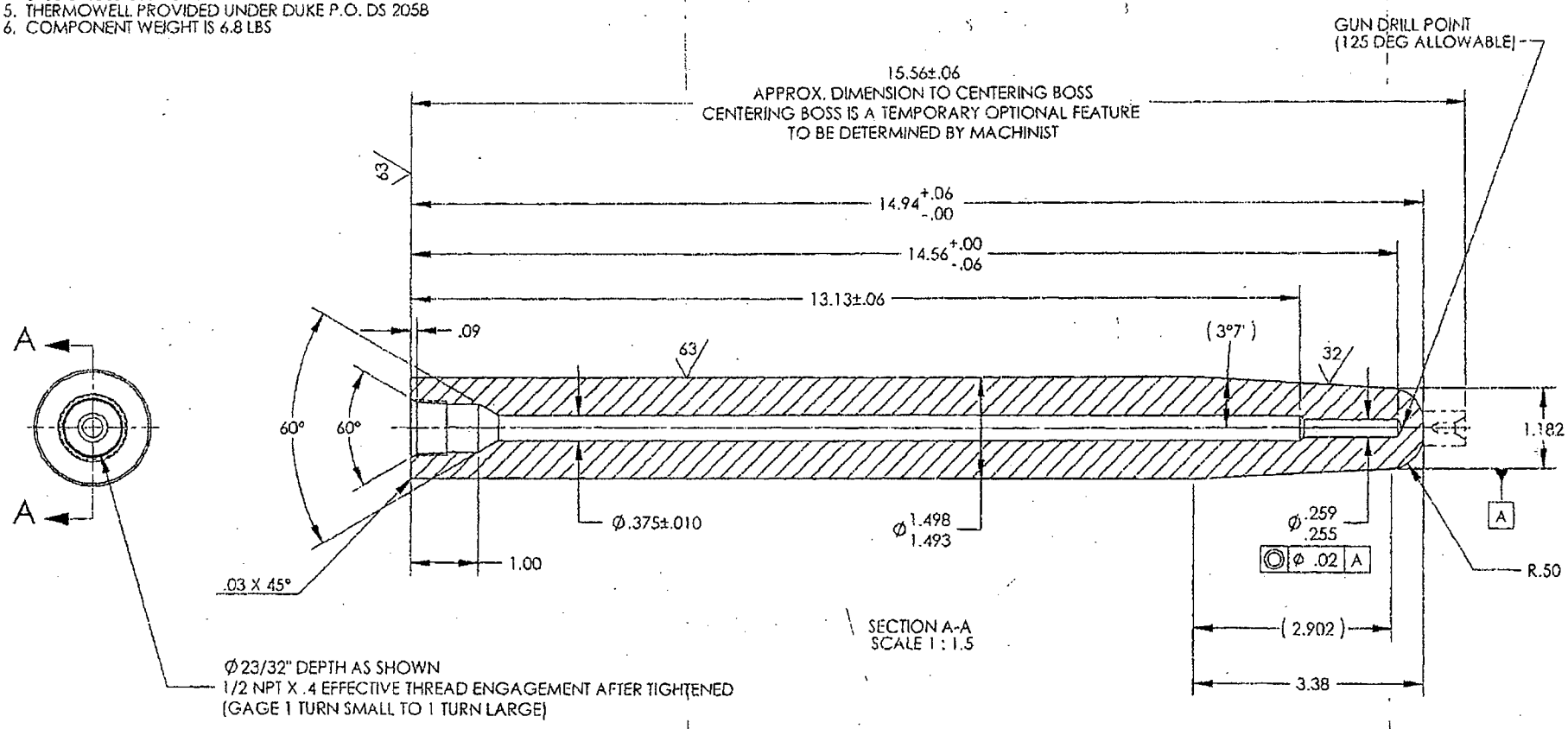
Attachment 2 to CAR 2008-08

ERN: 0X009LMV

REVISIONS			
REV	DESCRIPTION	DATE	REVISED BY
1	DRAFT REVIEW RELEASE	8-16-2006	PAMADOR
2	PRODUCTION RELEASE	8-24-2006	PAMADOR

NOTES:

1. BREAK ALL SHARP EDGES
2. FINISH: NONE
3. THERMOWELL DESIGN IN ACCORDANCE WITH SIA DWG ONS-15Q-05 FOR STRUCTURAL COMPLIANCE
4. THERMOWELL TO RTD ASSEMBLY CONFIGURATION IN ACCORDANCE WITH WEED INSTRUMENT DWG 0460-311035-001 REV 0
5. THERMOWELL PROVIDED UNDER DUKE P.O. DS 2058
6. COMPONENT WEIGHT IS 6.8 LBS



OM 2201.-3220 001

QA CONDITION 1

Attachment 2 to LAR 2008-08

STATUS	NO.	REVISIONS	DRN	DATE	CHKD	DATE	APPR	DATE
A	003	VENDOR ISSUED PER 00301377	FWP	1/9/08	LSW	1/9/08	OAK	1/15/08

INSPECTED: CIVIL | ELEC. | MECH. | OTHER

THIRD ANGLE PROJECTION

DRAWING NO.	401795
DESCRIPTION	UNS N06898 SIA SPEC SIS-06-006 REV 2
MATERIAL	
DRAWN	J.THOMAS 7/31/2006
CHECKED	PAMADOR 8/24/2006
UNLESS OTHERWISE SPECIFIED	TOLERANCES X: XXX ± .005, X: XX ± .015, X.X ± .03, ANGLES ± .5°, FRACTIONS ± 1/32"
WELDING SERVICES INC.	2225 SKYLAND COURT NORCROSS GA 30071
THERMOWELL,PZR,OCONEE	
SIZE	B
DRAWING NO.	401795
REV	D03
SCALE	1:4
	DO NOT SCALE DRAWING
SHEET	1 OF 1

ERN: 0X009MCE