Duke Energy®

T. PRESTON GILLESPIE, JR.
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP / 7800 Rochester Hwy.
Seneca, SC 29672

864-873-4478
864-873-4208 fax
T.Gillespie@duke-energy.com

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U.S. Nuclear Regulatory Commission - Region II
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

Subject: Oconee Nuclear Station Units 1, 2, and 3
Docket Nos. 50-269, 50-270 and 50-287
Regulatory Enforcement Conference - Follow-up Information in Support of the Significance Determination Process

On November 16, 2011, a Regulatory Enforcement Conference was held between the U.S. Nuclear Regulatory Commission (NRC) and Duke Energy Carolinas, LLC (Duke Energy) pertaining to recent apparent violations involving the Oconee Nuclear Station (ONS) Standby Shutdown Facility (SSF). Based on the Regulatory Enforcement Conference, Duke Energy is submitting additional information, in the form of a position paper on Treatment of Old Design Issues in the Assessment Process - SSF Pressurizer Heater Breaker Design Issue, to support the significance determination process. The position paper is provided in the Enclosure to this letter.

There are no regulatory commitments contained in this letter. If you have any questions regarding this submittal, please contact Kent R. Alter, ONS Regulatory Compliance Manager, at 864-873-3255.

Sincerely,

T P Gillespie

T. Preston Gillespie, Jr.,
Vice President
Oconee Nuclear Station

Enclosure

cc:

Mr. Victor McCree
Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

Mr. John Stang
Project Manager
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Mr. Andrew Sabisch
NRC Senior Resident Inspector
Oconee Nuclear Station

Enclosure

Oconee Nuclear Station - Position Paper
Treatment of Old Design Issues in the Assessment Process
SSF Pressurizer Heater Breaker Design Issue

NOTE: The enclosed document is seven (7) pages in length.

OCONEE NUCLEAR STATION POSITION PAPER
TREATMENT OF OLD DESIGN ISSUES IN THE ASSESSMENT PROCESS
SSF PRESSURIZER HEATER BREAKER DESIGN ISSUE

Purpose

The purpose of this position paper is to describe how the legacy design control finding for the Standby Shutdown Facility (SSF) Pressurizer Heater Breakers could be treated as an Old Design Issue in the assessment process in accordance with Inspection Manual Chapter (MC) 0305, Section 11.05(a).

Executive Summary

The goal of providing enforcement discretion in connection with Old Design Issues is to avoid disincentives for licensees to self identify and aggressively resolve significant legacy issues.

The condition at issue here was associated with the original design, is not reflective of current performance, and was identified and corrected prior to an occurrence where the safety system might have been called upon to work. Discovery of the issue through routine licensee efforts was unlikely.

Oconee pursued multiple success paths to find a permanent solution and has taken immediate corrective actions to restore the SSF to operable. Upon identification, the condition was promptly entered into the corrective action program and operability was addressed. As part of the long-term modification effort to restore compliance and prevent recurrence, Oconee demonstrated a strong questioning attitude. During the modification process, a number of long-standing discrepancies were uncovered and entered into the corrective action program and dispositioned in accordance with their safety significance. Enforcement discretion may be applied even if in the course of addressing the issue the licensee's actions were not error free in order to foster voluntary actions to discover and address design, engineering and installation violations that are not likely to be identified during routine surveillance or quality assurance activities.

On balance, the NRC should consider the treatment of this finding as an Old Design Issue based on the overall actions and behaviors which were prompt, continuous, and reflected a strong questioning attitude and positive change in the performance of the organization. In addition, the long-term corrective actions developed in response to this issue include an Independent Assessment to validate that Oconee's SSF meets the requirements of and is operated consistently with its design and licensing bases. Therefore, we believe Oconee is pursuing precisely the type of voluntary, formal initiative that enforcement discretion for Old Design Issues is intended to encourage licensees to embark upon to review past activities. The exercise of enforcement discretion for Old Design Issues in a case such as this creates the opportunity to foster incentives for licensees to exhibit behaviors and take actions consistent with the enforcement policy, and more broadly, the public health and safety.

Background

The NRC Enforcement Policy was codified as Appendix C of 10 CFR Part 2 in 1980. In 1988, the NRC revised the Enforcement Policy to allow for enforcement discretion in cases that were not representative of a breakdown in management controls. *NRC Policy Statement on*

Enforcement Actions, 53 Fed. Reg. 40,019 (October 13, 1988). This change was intended to avoid penalizing a licensee whose current performance is consistent with the objectives of the policy, i.e., identifying, reporting, and correcting violations. In 1992, the Enforcement Policy was revised to formally recognize and provide for mitigating discretion of Old Design Issues in Section VII.B.4. *NRC Policy Statement on Enforcement Actions,* 57 Fed. Reg. 5,791 (February 18, 1992). This version of the Policy provided the ability to use discretion in cases where the violation would not likely be otherwise identified through routine efforts and does not reflect current performance. This change was intended to place a premium on identifying design and installation violations before affected systems are called upon to work. The Enforcement Policy was removed from the Code of Federal Regulations in 1995 and continues to exist as a standalone document. The current version of the Enforcement Policy includes mitigation discretion for Old Design Issues and describes the criteria under which the discretion is applied. The Enforcement Policy indicates that an issue must be at least three (3) years old in order to be considered for discretion and that the purpose of discretion is to encourage licensees to initiate efforts to identify and correct violations that are not likely to be identified by routine efforts before degraded safety systems are called on to work.

The Reactor Oversight Process (ROP) was fully implemented on April 2, 2001. Most operating reactor findings that also involve violations are processed under the ROP. Following implementation, the ROP also recognized the need to encourage licensees to proactively assess their own processes and programs to identify performance issues. As a result, the Enforcement Policy criteria for Old Design Issue discretion were also included in Inspection Manual Chapter (MC) 0305, Section 11.05(a) with minimal changes.

Manual Chapter 0305, Section 11.05, "Treatment of items Associated with Enforcement Discretion"

The purpose of this approach continues to place a premium on licensees initiating efforts to identify and correct safety-significant issues, which are not likely to be identified by routine efforts, before safety systems are called upon to work. The criteria for treatment as an Old Design Issue are described below:

a. Treatment of Old Design Issues in the Assessment Process. A finding associated with engineering calculations or analysis, associated operating procedure, or installation of plant equipment is considered an Old Design Issue if it meets all of the following criteria:

    1. It was licensee-identified as a result of a voluntary initiative, such as a design basis reconstitution. For the purposes of this MC, self-revealing findings which are defined in MC 0612 are not considered to be licensee-identified.

    2. It was or will be corrected, including immediate corrective actions and long-term comprehensive corrective actions to prevent recurrence, within a reasonable time following identification (this action should involve expanding the initiative, as necessary, to identify other failures caused by similar root causes). For the purpose of this criterion, identification is defined as the time when the significance of the finding is first discussed between the NRC and the licensee. Accordingly, issues being cited by the NRC for inadequate or untimely corrective actions are not eligible for treatment as Old Design Issues.

3. It wasn't likely to be previously identified by ongoing licensee efforts, such as normal surveillance, quality assurance activities, or evaluation of industry information.

4. It does not reflect a current performance deficiency associated with existing licensee programs, policy, or procedure.

If all the Old Design Issue criteria are met, then the finding would not aggregate in the Action Matrix with other performance indicators and inspection findings.

Description of the Finding

Oconee identified a question related to elevated ambient temperature impact on the qualification of breakers in the east penetration room during scoping activities for an unrelated modification. While this condition did not impact the current design of the plant, a review was performed by engineering to see if this condition could have been created elsewhere. The behavior demonstrated a strong questioning attitude which led to the discovery of a degraded condition with the SSF Pressurizer panel board breakers inside containment which could prematurely open at high ambient temperatures. The concern was captured in the corrective action program (PIP O-11-6700). This concern was identified to be common to all three units. Operability was immediately evaluated and the Technical Specification (TS) Action Statement was entered for all three units.

The initial question centered on the ability of the molded case circuit breakers (MCCBs) inside Containment to properly function due to rising ambient temperatures following an extended loss of AC power. Research of the vendor design literature indicated the thermal overloads associated with the breakers may cause the breakers to trip prematurely. MCCBs with thermal overloads had been installed in this application as part of the original design of the station.

Consideration of Old Design Issue Criteria

1. **It was licensee-identified as a result of a voluntary initiative, such as a design basis reconstitution. For the purposes of this MC, self-revealing findings which are defined in MC 0612 are not considered to be licensee-identified.**

   The degraded condition was self-identified by the licensee through unrelated modification activities and would not have been revealed through routine efforts. The discovery of the potential for the SSF Pressurizer heater breakers to open on increasing ambient temperature in the event of an extended loss of AC power is an example of a strong questioning attitude, which satisfies one of the fundamental objectives of the discretion policy. This condition was a legacy issue associated with the original design and is not reflective of current performance. This issue was identified and corrected prior to an occurrence where the safety system might have been called upon to work.

2. **It was or will be corrected, including immediate corrective actions and long-term comprehensive corrective actions to prevent recurrence, within a reasonable time following identification (this action should involve expanding the initiative, as necessary, to identify other failures caused by similar root causes). For the purpose of this criterion, identification is defined as the time when the significance of the finding is first discussed between the NRC and the licensee.**

Accordingly, issues being cited by the NRC for inadequate or untimely corrective action are not eligible for treatment as old design issues.

Oconee has taken immediate corrective actions and the planned long-term actions to prevent recurrence are comprehensive. Upon identification, the condition was promptly entered into the corrective action program and operability was considered. The condition was recognized to impact all three (3) units, and the TS Action Statement was entered when the breakers were declared inoperable. The licensee pursued multiple success paths. The initial solution included the installation of a breaker of a different design that did not have the thermal overload feature. The final solution was to install fuses to restore the SSF to operability. The fuses were installed as a fully qualified component.

As part of the investigatory efforts to restore compliance, Oconee continued to demonstrate a strong questioning attitude. The team investigations uncovered a number of long standing discrepancies that were entered into the corrective action program and dispositioned in accordance with their safety significance. Below please find a listing of the modifications that were implemented in conjunction with and in addition to the long-term actions completed or planned to prevent recurrence.

- EC106229, EC106230 and EC106231 Replaced original breakers with New Design
- EC106356, EC106357 and EC106358 Replaced SSF PZR heater breakers in Containment with qualified fuses
- EC106427, EC106428 and EC106429 Replaced 200A and150A Breakers upstream of SSF PZR Heater Breakers
- EC106490, EC106491 and EC106492 SSF PRZ Heater cable splicing in Delta boxes EC106537, EC106538 and EC106539 Removed Group B / Bank 2 Pressurizer Heater Ground Fault Alarm Circuit
- EC106614 Replaced SSF Diesel Generator Service Water flow transmitter with qualified transmitter

Oconee made two missteps in its actions to restore compliance that resulted in NRC findings that should be considered in applying this criterion. The first finding is associated with the modification process in which Oconee continued to test the breakers in parallel with their installation. The breakers were declared operable before obtaining all design inputs, contrary to procedures. The installation of the new breakers without thermal overloads was a significant risk reduction; however, Oconee should not have declared the breakers operable without completing the testing. The initial offsite test showed the breakers failed. However, ongoing testing demonstrates that the newly installed breakers would have likely performed their intended function for a period of time ranging from twenty four to greater than seventy two hours. Oconee's actions were a violation of the procedure which is being handled under a separate enforcement action. In spite of this first misstep, Oconee demonstrated a questioning attitude in its continuous efforts to implement long-term actions to prevent recurrence.

The second misstep is with the crediting of water solid operations (WSO) as part of its operability determination. Oconee failed to recognize that reliance on an existing procedure should have been considered a compensatory action which, if recognized, would have required a 10 CFR 50.59 evaluation. Oconee has credited WSO in the past

and recognized the need to treat this as a compensatory action and had performed a prior 10 CFR 50.59 evaluation. Based upon previous interactions with the NRC, the licensee erroneously believed crediting of WSO was appropriate for the situation.

This criterion may be met even if in the course of addressing the issue, the licensee's actions were not error free. The 1992 revisions to the NRC's enforcement policy provided for expanded use of discretion to encourage self-identification and correction of certain violations involving old design, engineering or installation failures. The Federal Register notice discussing the goals of this policy revision noted that the NRC may exercise this discretion for violations meeting the required criteria even when the licensee failed to make a required report the NRC. In such circumstances, "a separate enforcement action will normally be issued for the licensee's failure to make a required report." *NRC Policy Statement on Enforcement Actions,* 57 Fed. Reg. 5,791 (February 18, 1992).

Similarly, the NRC granted enforcement discretion to Omaha Public Power District (OPPD) related to a failure to assure that the control room air conditioning unit design modification correctly translated the design basis specifications for assuring system operability during certain design basis accidents. As a result, the control room air conditioning units that were purchased and installed in 1988 were not capable of operating within the component cooling water maximum temperatures following a postulated main steam line break inside the containment or a large break LOCA. The NRC found that the criteria for an Old Design Issue were met despite the fact that OPPD failed to implement the established procedures for the documentation and evaluation of the design deficiency for over a month upon discovery. The NRC exercised discretion to forgo a civil penalty for the legacy issue and issued a separate violation for the delay in prompt operability determination. *Omaha Public Power District, Notice of Violation and Enforcement Discretion*, NRC OE EA 94-267, NURREG-0940 Vol. 14, No. 1, I.C-40 (February 15, 1995).

In this matter the NRC has issued a separate notice of violation addressing the current performance issue, which should not preclude the exercise of discretion as to the legacy issue. Thus, on balance, the NRC should consider the treatment of the legacy finding as an Old Design Issue based on the overall actions and behaviors which were prompt, continuous, and reflected a strong questioning attitude.

3. **It was not likely to be previously identified by recent ongoing licensee efforts, such as normal surveillance, quality assurance activities, or evaluation of industry information.**

The ability for discovery was not likely through on-going licensee efforts. Breakers with thermal overloads had been installed since original plant construction. The failure mechanism identified would only manifest itself after a loss of AC power and the subsequent increasing temperatures in the Containment due to loss of cooling. There is no reasonable means to duplicate the conditions outside a specific test facility, which prevented the development of an on-going surveillance or Preventive Maintenance (PM) process to validate the design features. A thorough search of the Operating Experience was conducted as part of the root cause evaluation, including searches performed by independent resources. Several examples of industry experience were found that reflected some level of long-term thermal related degradation during normal operation; however, this information was primarily focused on normally energized

breakers during normal operation with reliability issues and/or inadequate PMs which would not have prompted a thorough reevaluation of the original breaker design criteria during accident conditions.

4. **It does not reflect a current performance deficiency associated with existing licensee programs, policy, or procedure.**

   The breakers of concern were the same style of breakers that had been installed during original construction. The design weakness was identified through a strong questioning attitude exhibited by the design engineers involved with an ongoing design effort for other plant modifications unrelated to the SSF-powered Pressurizer heaters. Additionally, as noted above, the team's investigation reached well beyond the specific design feature that first came into question, resulting in expansive and comprehensive corrective actions to address other potential issues associated with the environmental effects on other heaters, qualification of other SSF components, and the rigor of analyses and qualification documentation supporting this equipment.

Unintended Consequences

As a result of this event and in recognition of the history of design issues with the SSF, Duke Energy is pursuing an Independent Assessment (IA) of the SSF to begin in 2012. The objectives of the IA are:

- to validate the SSF is designed, constructed, operated, maintained and tested to meet the requirements of the design and licensing bases, and
- to validate the adequacy of design control, modification, maintenance, testing and surveillance, and operation to ensure performance consistent with the design and licensing bases.

The IA is precisely the type of voluntary, formal initiative that enforcement discretion for Old Design Issues is intended to encourage licensees to embark upon to review past activities that may reveal past violations that are not likely to be identified during routine surveillance or quality assurance activities.

As noted in the Federal Register notice describing the goals of the 1988 enforcement policy revisions:

> From a safety perspective clearly there are benefits for both a licensee and the public to have past problems such as those involving engineering, design, or installation identified, reported and corrected before a system with deficiencies is called upon to operate. In these cases discretion could be exercised regardless of prior notice, past performance, or duration to avoid disincentives for a licensee who is aggressively pursuing a formal program to identify and correct past problems.

NRC Policy Statement on Enforcement Actions, 53 Fed. Reg. 40,019, 40,020 (October 13, 1988). The use of enforcement discretion as to the legacy finding at issue in the instant case, as well as any subsequent violations discovered in connection with the IA, avoids penalizing Oconee for engendering a strong questioning attitude and voluntarily and aggressively pursuing broad and expansive actions in connection with its most risk significant system. To do otherwise would serve to inhibit desired behaviors and hinder performance consistent with the goals and

objectives of the enforcement policy as cited above, i.e., identifying and correcting past problems that are not otherwise likely to be identified by either the licensee or the NRC through routine surveillance and inspection activities.

The benefit to the public of exercising enforcement discretion for Old Design Issues has been recognized in the enforcement policy for over 20 years. The unintended consequences of a decision not to exercise enforcement discretion when warranted impacts the licensee involved as well as the industry as a whole. In addition to penalizing the particular licensee subject to significant enforcement action, such regulatory action would create disincentives for all other licensees to demonstrate a strong questioning attitude, perform broad extent of condition evaluations and voluntarily purse self assessments on risk significant systems. This unintended consequence would lead to legacy conditions, which are unlikely to be self-revealing or that the NRC and licensees will not likely find though routine efforts, going uncorrected. Regulatory actions send important messages that are designed to change behaviors where needed and reinforce positive behaviors. The exercise of enforcement discretion for Old Design Issues in a case such as this creates the opportunity to foster incentives for licensees to exhibit behaviors and take actions consistent with the enforcement policy, and more broadly, protection of the public health and safety.

Conclusion

As noted above the intent of providing for enforcement discretion related to Old Design Issues is to encourage licensees to self identify and aggressively resolve significant legacy issues. The SSF failures that led to the Yellow finding in 2010 were heavily influenced by the failure of the organization as a whole to take aggressive action to address extent of condition. The performance of the organization during the SSF Pressurizer heater breaker issue was clearly a strong positive change as compared to the response to the SSF letdown filter failure. Since the issue was identified, the Duke Energy team has processed multiple parallel repair options with several options only being shelved when testing and/or analysis could not clearly demonstrate acceptability. During the investigation efforts there were a significant number of entries into the site's corrective action program for a wide variety of peripheral questions and concerns ultimately resulting in resolution of other legacy issues such as temperature de-rating of pressurizer cabling, capacity concerns with the breakers associated with the non-SSF powered pressurizer breakers and questions on seismic qualification of SSF diesel service water pressure transmitters. The overall response to the specific breaker issue will collectively resolve many other unknown legacy design concerns.

The Old Design Issue concept as currently captured in MC 0305 was first introduced in 1988 and is reflected in the following statement: "Because the NRC wants to encourage and support licensee initiative for self identification and correction of problems, NRC may exercise discretion..." *NRC Policy Statement on Enforcement Actions,* 53 Fed. Reg. 40,019 (October 13, 1988). Based on the discussions provided above, Duke Energy believes that the issue that existed with the SSF Pressurizer heater breakers is a clear candidate for such treatment. The efforts applied in addressing what was initially seen as a single legacy design weakness is a step towards reinforcing the desired behaviors needed from the organization. Consideration of this issue as an Old Design Issue clearly sends a strong message to Oconee's work force as well as a strong endorsement of the IA effort reflecting the NRC's desire to encourage the broad corrective actions and questioning attitudes displayed in responding to this issue.