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10 CFR 50.59 and 10 CFR 50.4

July 1, 2013

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

Subject: Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station, Units 1, 2, and 3
Docket Nos. 50-269, 50-270, 50-287
10 CFR 50.59 Annual Report

Attached are descriptions of Oconee Nuclear Station changes, tests, and experiments which were completed subject to the provisions of 10 CFR 50.59 between January 1, 2012 and December 31, 2012. This report is submitted pursuant to the provisions of 10 CFR 50.59(d)(2) and 10 CFR 50.4.

This submittal document contains no regulatory commitments.

If there are any questions, please contact Susan Perry at (864) 873-4370.

Sincerely,

Scott L. Batson

Attachment

IE47
NRR

xc:

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Title: EC 104580 Revision 0 - Bypass Coil on Keowee Hydro Unit 2 Generator Stator (AR#00391086)[1]

Summary:
A high potential test was performed on the Keowee Hydro Unit (KHU) 2 generator. This high potential test found some leakage current during the last scheduled periodic testing. This leakage current could be an indication of insulation degradation. Engineering Change (EC) 104580 was developed as a contingency design change in case a degraded coil is found during the next scheduled testing of KHU 2.

EC 104580 is to modify the stator by bypassing (jumpering) one degraded coil in one phase. It is currently unknown which coil, if any, may need to be bypassed. The EC is developed for worst case degraded coil and bounds any coil in the KHU 2 generator's stator windings. This EC requires the KHU 2 generator to be derated to 78MVA (Megavolt Amperes). Derating of the machine will keep the machine within its 100% rated capacity design temperature rise of 60°C. Keowee Operations control the KHUs by referencing MW (megawatt) reading instead of MVA. Therefore, a value of 75MW was determined to be the operational limit to ensure the 78 MVA rating is not exceeded for KHU 2.

The scope of the EC is only to bypass one coil on one phase. No changes are made to any alarms, setpoints, sensors, trips, Emergency Power Switching Logic (EPSL), Engineered Safeguards (ES) logic, Main Feeder Bus Monitoring and logic, etc.

The jumpering of a coil requires several Updated Final Safety Analysis Report (UFSAR) changes. The current rating of the KHUs is 87.5 MVA each. The rating on the modified KHU will be 78 MVA. The 87.5 MVA (87,500 kVA – kVA is kilovolt amperes) rating is listed in several UFSAR sections, one table, and one figure. The affected sections/table/figure will need to be revised as a result of the EC to reflect the new rating for KHU 2. The markups to the UFSAR are included in the EC package. The affected sections, table, and figure are as follows: Sections 1.2.2.6, 3.1.39, 8.3.1.1.1, and 8.3.1.2, Table 8-1, and Figure 8-1.

The EC also includes revisions to Selected License Commitment (SLC) 16.8.4. This SLC addresses Keowee operating restrictions. SLCs 16.8.4.a and 16.8.4.b currently provide maximum operating output limits and operating head limits to ensure Keowee Units operating for grid generation can respond to an event that requires emergency power. The SLC limits are reduced for KHU 2 due to its derating.

The rated output for each KHU is given as 87.5 MVA (87,500 kVA). Jumpering of the coil will cause some increased heating. The output of KHU 2 will be reduced to 78 MVA (78,000 kVA) to ensure the generator will stay within its design temperature rise.

The 78,000 kVA rating is still extremely large for the maximum stated load demand given in the UFSAR. The modified KHU is still sized adequately to provide power for Oconee loads required to start and/or run during a Loss of Coolant Accident/Loss of Offsite Power (LOCA/LOOP) event. There is sufficient margin in the generator sizing to allow the operator to start additional loads as desired to assist in event mitigation and that there is sufficient guidance given to the operator so that transformer ratings will not be exceeded.

[1] The AR (Activity Record) number is used to track the 10 CFR 50.59 report in Duke Energy's database.

Since Keowee Operations control the KHUs by referencing MW reading instead of MVA, a value of 75MW was determined to be the operational limit to ensure the 78 MVA rating is not exceeded for KHU 2. The new KHU 2 operating restrictions of 75 MW that are to be included in SLC Section 16.8.4 still provides adequate limits for acceptable overshoot and startup within an acceptable time frame.

The jumpering of a coil does not change the output during alignment to the grid such that the modified KHU would cause any increase in the potential for a loss of offsite power or Station Blackout (SBO). There will be no adverse impact to the commercial grid from bypassing a coil on KHU 2. The grid is almost an infinite source of power when compared to one 78 MVA unit. Therefore, there is no adverse affect that could cause a grid disturbance that would create a LOOP or SBO scenario.

The jumpering of a coil does not cause any adverse effects to Oconee equipment that is powered by KHUs on loss of power. The potential effects on Oconee equipment from jumpering a coil are voltage, frequency, harmonics, and negative sequence currents. These effects were evaluated and have no adverse effect on equipment.

This EC does not make any changes to the auto starting of the KHUs on emergency start signal from the EPSL or ES signal.

Heating effects in the stator, rotor bars, and damper bars due to circulating currents have been analyzed and have no adverse localized effects on heating, thermal aging, or efficiency of the generator.

There are two Keowee Generators, each one capable of supplying emergency load requirements. The modification of the KHU2 is isolated to the unit itself and has no adverse affect on the KHU 1. Thus, the EC does not affect the ability of the KHUs from providing emergency power in the event of a single failure since the modified unit can still perform its design function.

The UFSAR provides information that the KHU generators are QA-1. The EC is QA-1.

The KHUs are part of the Seismic Qualification Utility Group (SQUG) program. The additional weight of the jumper has been evaluated and is acceptable such that the EC will not degrade the existing seismic evaluation of the Keowee generator.

Evaluations of the impacts on the generator's vibration due to the bypassing of the coil concluded that effects will be negligible.

Thus, the EC does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the UFSAR.

SLC Section 16.8.4 addresses Keowee operational restrictions. SLCs 16.8.4.a and 16.8.4.b provide maximum operating output limits and operating head limits to ensure Keowee Units operating for grid generation can respond to an event that requires emergency power. In responding to such an event, the Keowee unit will load reject, overspeed on loss of load causing the wicket gates on the unit to close and then return to rated speed by reopening of the gates. The limits of SLC 16.8.4 ensure that gate position is maintained such that the governor control system can manipulate the gates in the required time to reestablish the required speed. The EC

determined that there would be an insignificant change in gate position due to the jumpering of a coil and thus there would be no effect to the requirements of SLC 16.8.4 from this perspective. Thus the existing MW limits that are in the SLC for providing an acceptable overshoot and startup within an acceptable time are not changed. Due to the revised KHU 2's rating being below the existing SLC output limits, the maximum output limits were divided into separate commitments for KHU 1 and KHU 2. The KHU 2 output limits are reduced to the maximum rated output limits due to the jumpering of the coil. Since the KHU 2 will have a lower limiting operating restriction, it is also adequate for providing an acceptable overshoot and startup within an acceptable time frame for KHU 2.

Analyzed consequences are not affected by this activity. No new accidents of a different type or malfunctions of structures, systems, or components important to safety with a different result than any previously evaluated are postulated. This activity does not affect the design basis limits of fission product barriers. The activity does not involve a departure from a UFSAR described method of evaluation.

Title: EC101903 adds one three phase overcurrent relay and two auxiliary relays to the existing busline protection relay system for the Unit 1 startup transformer CT1 to comply with the standards set by Power Delivery (and enforced by NERC and SERC) for backup protection to the existing busline differential relays 87TB/CT1{X,Y,Z} (AR#00398299)

Summary:
EC101903 installs a single QA Condition 1 three phase overcurrent relay and two QA Condition 1 auxiliary relays and associated components and wiring to the existing busline protection relay system for ONS Unit 1. These relays will provide backup protection on the startup transformer busline between the 230 KV switchyard breakers PCB 17 and PCB 18 and the ONS Unit 1 Startup Transformer CT1. This protective relay design ensures that electrical faults on the startup transformer busline are cleared quickly without removing from service additional elements of the power system. The addition of these new relays will allow ONS to correct the non compliance condition with the standards set by the Duke Energy Power Delivery Department (and enforced by NERC and SERC) for backup protection to the existing busline differential relays 87TB/CT1{X,Y,Z}.

The installation of the three new relays and associated components and wiring cannot initiate a design basis accident. The failure modes of the three new relays and associated components and wiring were analyzed and compared to the failure modes of the existing relays and it was determined that malfunctions of these new relays and associated components and wiring would not significantly increase the likelihood of an occurrence of a malfunction of an SSC important to safety. Therefore, installation of these three relays and associated components and wiring will not result in an accident or malfunction that has been previously evaluated in the ONS UFSAR.

There are no accidents whose resultant doses could be adversely affected by the addition of the three new backup busline relays and associated components and wiring being installed per EC101903. None of these relays or monitoring components and wiring being installed can affect the radiation doses from any accident since the purpose of these relays is only to backup existing relays that accomplish the same circuit isolation during a bus line fault. The consequences of a malfunction of the existing ONS Unit 1 Busline relays have been bounded by the Single failure analysis tabulated in item 1 of table 8-4 of the UFSAR (i.e., the loss of the

Yellow bus is a bounding condition of the malfunction being analyzed). Therefore installation of the three new relays and associated components and wiring will not result in more than a minimal increase in the consequences of an accident or malfunction that has been previously evaluated in the ONS UFSAR.

The installation of the three new relays and associated components and wiring does not create a possibility of an accident or malfunction of a different type than any previously evaluated in the ONS UFSAR because the new relays and associated components and wiring and the existing relays cannot create an accident and the failure modes of these three new relays are the same as the failure modes of the existing busline protective relays. Since there are no new types of accidents created by the addition of these three relays and associated components and wiring and since these three relays and associated components and wiring have the same failure modes as the existing relays and associated components and wiring, there are no new accidents or malfunctions of a different type as previously evaluated in the ONS UFSAR.

The design basis limits for fission product barriers were set based on the availability of one of the Emergency Power Paths being available to supply power to the Main Feeder bus. This available path could be from the overhead Emergency Power Path through the ONS 230kV switchyard Yellow bus or from the Underground Emergency Power path for transformer CT4. Removing either one of these Emergency Power Paths would not result in a design basis limit being exceeded as can be seen in UFSAR Table 8-4 titled Single Failure Accident Analysis for Emergency Electrical power Systems. Therefore the installation of the three relays and associated components and wiring will not result in a design basis limit for a fission product barrier as described in the ONS UFSAR being exceeded or altered.

The existing busline relay settings and the relay settings of the three new relays are justified by calculation OSC-4300, titled "(Elec.) Protective Relay Settings". The other associated components and wiring have no settings. Therefore, no changes are made to any methods of evaluation. Engineering Change EC101903 does not involve fission product barriers or safety analysis related to Containment or RCS and Reactor accident analyses. Therefore, the installation of the three new relays and associated components and wiring will not result in a departure from a method of evaluation described in the ONS UFSAR used in establishing the design bases or in the safety analysis.

Title: Revisions to UFSAR Section 15.12 Rod Ejection Accident for an increase in Peaking (Fq) which leads to an increase in Peak Fuel Pellet Enthalpy (AR#00391691)

Summary:
The proposed activities are revisions to UFSAR Section 15.12 (Rod Ejection Accident) peak enthalpy analysis. For the purposes of this 50.59 Evaluation, peak enthalpy will also be referred to as peak pellet enthalpy and peak pellet radial average enthalpy. The activity described in this 50.59 Evaluation arises from revisions to the respective underlying calculation. A summary of the UFSAR changes include:

UFSAR Section 15.12 (Rod Ejection Accident):

(i) an update to Table 15-2 (Rod Ejection Accident Analysis Results) for the BOC partial power (77% of 2568 MWt) peak UO_2 fuel pellet average enthalpy (cal/gm) and peak UO_2-gad fuel pellet average enthalpy (cal/gm). The peak radially averaged pellet enthalpy increased from 96 cal/gm to 113 cal/gm and from 81 cal/gm to 95 cal/gm, for UO_2-Gd fuel and UO_2 fuel, respectively.

Technical Specifications are not effected. There is no impact on the frequency of occurrence of an accident or an SSC important to safety. There is also no impact on dose consequences. There is also no possibility for an accident of a different or no possibility for a malfunction of an SSC important to safety with a different result. Design basis limits for fission product barriers are not altered or exceeded and no departures from a method of evaluation.

Title: Oconee Unit 3 Cycle 27 Reload (AR#00394688)

Summary:
This activity installs the core designed for Oconee Nuclear Station Unit 3 Cycle 27 (O3C27). The O3C27 Reload Design Safety Analysis Review (REDSAR), performed in accordance with Engineering Directives Manual EDM-501, "Engineering Change Program for Nuclear Fuel", and the O3C27 Reload Safety Evaluation confirms the UFSAR accident analyses remain bounding with respect to predicted O3C27 safety analysis physics parameters (SAPP), and fuel thermal and mechanical performance limits. The SAPP method is described in topical report DPC-NE-3005-PA, "UFSAR Chapter 15 Transient Analysis Methodology."

There are Technical Specification changes related to four separate License Amendment Requests (LARs) associated with the Oconee Unit 3 Cycle 27 (O3C27) reload core. The LARs and their status are:

1. CASMO-4/SIMULATE-3 LAR dated June 10, 2009 and supplements dated December 18, 2009 and August 25, 2010. The Safety Evaluation (SE) was received in a letter dated August 2, 2011. This LAR added DPC-NE-1006-P-A, "Oconee Nuclear Design Methodology Using CASMO-4/SIMULATE-3" to the approved methodology report list in Technical Specification 5.6.5.b and is necessary to design cores containing Gadolinia. Technical Specification 5.6.5.b has been updated already.

2. Gadolinia LAR dated October 19, 2009 and supplemented November 15, 2010. The SE was received in a letter dated July 21, 2011. This LAR added the Gadolinia fuel melt limit to Technical Specification 2.1.1. This LAR is necessary to allow the use of Gadolinia as an integral burnable absorber in selected fuel pellets. Technical Specification 2.1.1 has been updated already.

3. 24 month cycles LAR. The SE is provided in Reference 22. Some changes required for 24 month operation are being performed via a separate 50.59 evaluation that will be completed prior to exceeding 18 months of operation. O3C27 is designed to operate for the entire 24 months.

4. Measurement Uncertainty Recapture (MUR) LAR. Technical Specification changes required for the MUR uprate have been included in the LAR. The SE has not yet been received. In addition to the LAR, some changes required for the MUR uprate are being performed via a separate 50.59 evaluation that will be completed prior to implementing the MUR uprate. The lack of a SE and a 50.59 evaluation for the MUR uprate does not impact the startup and operation of O3C27. The O3C27 core design accommodated the uprated power level which bounds the current licensed power level. The unit will operate at its current licensed power condition until the SE is received and all necessary changes have been implemented. Therefore, NRC approval of this LAR is not required for O3C27 to operate for its designed cycle length.

Additionally, O3C27 is the second reload core design to be loaded with an entire core of Mk-B-HTP fuel. This is the culmination of the HTP Fuel Transition LAR dated October 22, 2007 and supplemented July 14, 2008. The SE was received in a letter dated October 29, 2008.

The O3C27 core reload is similar to past cycle core designs, with a design generated using NRC approved methods, including those method changes approved in the above identified SEs. The O3C27 Core Operating Limits Report (COLR) was prepared in accordance with Technical Specification 5.6.5. Additionally, applicable Technical Specifications have been reviewed and no further changes are required for the startup and operation to 18 months for O3C27. This 10CFR50.59 evaluation concluded that no additional NRC approval is necessary for O3C27 startup and operation for 18 months.

Title: Transition to 24 Month Cycles (AR#00401692)

Summary:
To accommodate Oconee Nuclear Station (ONS) transition to a 24 month fuel cycle certain surveillance requirements and testing or inspection intervals identified in the Updated Final Safety Analysis Report (UFSAR), primarily Selected Licensee Commitments (SLCs) and License Renewal (LR) requirements, are being extended. References to18 month frequencies, when intended to describe the length of a fuel cycle, have been changed.

In addition to the impacts on surveillance and inspection/testing frequencies, UFSAR section 9.1.3.3.1 on the Spent Fuel Cooling System normal operation was revised to address 24 month cycles. Also, the isotopic source term calculation was revised to model 24-month fuel cycles resulting in revisions to UFSAR section 15.15.5 and Tables 15-15 and 15-16.

Title: Startup Accident Peak Pressure Analysis Impact due to a Decrease in Reactor Coolant System (RCS) Flow (AR#00405811)

Summary:
The proposed activities are revisions to the Oconee Nuclear Station (ONS) UFSAR Section 15.2 (Startup Accident). A summary of the UFSAR changes include:

(i) an update to Text in UFSAR Section 15.2.2 (Analysis) and Section 15.2.3 (Conclusions) to address increases to maximum hot leg indication Reactor Coolant

System (RCS) pressure from 2682 psig to 2684 psig and peak RCS pressure at the bottom of the reactor vessel from 2731.2 psig to 2733.0 psig.

(ii) an update to Table 15-34 (Summary of Input Parameters for Accident Analysis Using Computer Codes) to address a decrease in RCS flow.

The changes to the calculation that produced these results are summarized due to an analysis change for a revised RCS Flow of 272,624 gpm from 277,406 gpm. This change resulted in increases to maximum hot leg indication Reactor Coolant System (RCS) pressure and peak RCS pressure at the bottom of the reactor vessel described in (i). This change occurred as a result of the following changes.

1) The recalculation of the RCS flow uncertainty due to 24 month cycles and digital RPS/ES.
2) The change to appropriately use the newly calculated 3-pump uncertainty rather than the previous 4-pump uncertainty of 2%.

Per NEI 96-07, Rev. 1, this activity required a 50.59 evaluation because the decrease in initial RCS flow adversely affects the design function of an SSC as described in the UFSAR. The change in this parameter (RCS flow) does not impact the frequency of occurrence of an accident previously evaluated or the malfunction of an SSC important to safety. Since the peak pressure limit was not exceeded and the RCS is not breached, there could be no dose impact on any accidents or SSC's. There are no physical changes to any SSC's, no different modes of operation, no procedure changes, or no failure of the design function from this activity. Thus, the proposed activity does not create the possibility for an accident of a different type or malfunction of an SSC important to safety with a different result. Since the peak pressure limit is not violated in the loss of startup accident, the fission product barrier for the RCS is also not exceeded or altered. Since the methodology for the accident is not changed or impacted there are no departures from methods of evaluation.

Title: EC101905 - Unit 3 Add Additional CT3 Busline Protection via 51TB/CT3 Relays in 230KV Switchyard (AR#00379704)

Summary:
EC101905 installs a single QA Condition 1 three phase overcurrent relay and two QA Condition 1 auxiliary relays and associated components and wiring to the existing busline protection relay system for ONS Unit 3. These relays will provide backup protection on the startup transformer busline between the 230 KV switchyard breakers PCB 28 and PCB 30 and the ONS Unit 3 Startup Transformer CT3. This protective relay design ensures that electrical faults on the startup transformer busline are cleared quickly without removing from service additional elements of the power system. The addition of these new relays will allow ONS to correct the non compliance condition with the standards set by the Duke Energy Power Delivery Department (and enforced by NERC and SERC) for backup protection to the existing busline differential relays 87TB/CT3{X,Y,Z}.

The installation of the three new relays and associated components and wiring cannot initiate a design basis accident. The failure modes of the three new relays and associated components and wiring were analyzed and compared to the failure modes of the existing relays and it was determined that malfunctions of these new relays and associated components and wiring would

not significantly increase the likelihood of an occurrence of a malfunction of an SSC important to safety. Therefore, installation of these three relays and associated components and wiring will not result in an accident or malfunction that has been previously evaluated in the ONS UFSAR.

There are no accidents whose resultant doses could be adversely affected by the addition of the three new backup busline relays and associated components and wiring being installed per EC101905. None of these relays or monitoring components and wiring being installed can affect the radiation doses from any accident since the purpose of these relays is only to backup existing relays that accomplish the same circuit isolation during a busline fault. The consequences of a malfunction of the existing ONS Unit 3 Busline relays have been bounded by the Single failure analysis tabulated in item 1 of table 8-4 of the UFSAR (i.e., the loss of the Yellow bus is a bounding condition of the malfunction being analyzed). Therefore installation of the three new relays and associated components and wiring will not result in more than a minimal increase in the consequences of an accident or malfunction that has been previously evaluated in the ONS UFSAR.

The installation of the three new relays and associated components and wiring does not create a possibility of an accident or malfunction of a different type than any previously evaluated in the ONS UFSAR because the new relays and associated components and wiring and the existing relays cannot create an accident and the failure modes of these three new relays are the same as the failure modes of the existing busline protective relays. Since there are no new types of accidents created by the addition of these three relays and associated components and wiring and since these three relays and associated components and wiring have the same failure modes as the existing relays and associated components and wiring, there are no new accidents or malfunctions of a different type as previously evaluated in the ONS UFSAR.

The design basis limits for fission product barriers were set based on the availability of one of the Emergency Power Paths being available to supply power to the Main Feeder bus. This available path could be from the overhead Emergency Power Path through the ONS 230kV switchyard Yellow bus or from the Underground Emergency Power path for transformer CT4. Removing either one of these Emergency Power Paths would not result in a design basis limit being exceeded as can be seen in UFSAR Table 8-4 titled Single Failure Accident Analysis for Emergency Electrical power Systems. Therefore the installation of the three relays and associated components and wiring will not result in a design basis limit for a fission product barrier as described in the ONS UFSAR being exceeded or altered.

The existing busline relay settings and the relay settings of the three new relays are justified by calculation OSC-4300, titled "(Elec.) Protective Relay Settings". The other associated components and wiring have no settings. Therefore, no changes are made to any methods of evaluation. Engineering Change EC101905 does not involve fission product barriers or safety analysis related to Containment or RCS and Reactor accident analyses. Therefore, the installation of the three new relays and associated components and wiring will not result in a departure from a method of evaluation described in the ONS UFSAR used in establishing the design bases or in the safety analysis.

Title: Oconee Unit 1 Cycle 28 Reload (AR#00415780)

Summary:
This activity installs the core designed for Oconee Nuclear Station Unit 1 Cycle 28 (O1C28). The O1C28 Reload Design Safety Analysis Review (REDSAR), performed in accordance with Engineering Directives Manual EDM-501, "Engineering Change Program for Nuclear Fuel", and the O1C28 Reload Safety Evaluation confirms the UFSAR accident analyses remain bounding with respect to predicted O1C28 safety analysis physics parameters (SAPP), and fuel thermal and mechanical performance limits. The SAPP method is described in topical report DPC-NE-3005-PA, "UFSAR Chapter 15 Transient Analysis Methodology."

The O1C28 core reload is similar to past cycle core designs, with a design generated using NRC approved methods. The O1C28 Core Operating Limits Report (COLR) was prepared in accordance with Technical Specification 5.6.5. Additionally, applicable Technical Specifications have been reviewed and no changes are required for the operation of O1C28. This 10CFR50.59 evaluation concluded that no prior NRC approval is necessary for O1C28 operation.

Title: Revise SLC 16.5.1 Revise Selected Licensee Commitment (SLC) 16.5.1 to extend the completion time for Inoperable Pressurizer Steam Space Vent Path (through the PORV) currently within Condition "A" from 30 days to 60 days (AR#00425330, Rev. 0 and 00425990, Rev. 1)

Summary:
This activity is to revise Selected Licensee Commitments (SLC) 16.5.1 to extend the allowed completion time for the pressurizer steam space vent (through the Power Operated Relief Valve (PORV)) to be restored to OPERABLE status from 30 days to 60 days. SLC 16.5.1 addresses the Reactor Coolant System (RCS) Vents. The SLC includes commitments to have four RCS vent paths operable, including one for the pressurizer steam space vent through the Power Operated Relief Valve (PORV). Existing Condition A is for one RCS vent path being inoperable. The required action to be taken for Condition A is to restore the vent path to OPERABLE status within a completion time of 30 days. Condition B addresses if two or more RCS vent paths are inoperable. Condition C addresses shutdown requirements if the required actions and associated completion times of Condition A or B are not met. Shutdown requirements are to be in MODE 3 in 12 hours and be in MODE 5 in 36 hours. The SLC change will create a new Condition A and it will be for the pressurizer steam space vent to be inoperable. The required action is to restore this path to OPERABLE status within the new completion time of 60 days. Existing Condition A will be changed to be new Condition B and it will then exclude the pressurizer steam space vent. There are no changes in the completion time for the other paths being made. Existing Conditions C will be changed to Condition D and will have the same required shutdown actions for new Conditions A, B, or C. The change to the SLC is desired to allow for more time to address the PORV vent path operability/functionality issue before having to shut down one or more units.

Several UFSAR Section 15 accidents discuss the use of the PORV for RCS pressure control for mitigation. These accidents include the startup accident, Rod Withdrawal at Power Accident, Turbine Trip Accident, Steam Generator Tube Rupture Accident, and Rod Ejection Accident. In these accidents, the PORV is addressed from the perspective of mitigating the accident. These

accident analysis discussions explicitly state that the pressurizer PORV is not credited. The accident has already occurred and the PORV is not addressed as the cause. Thus, the PORV's operability or lack of operability does not affect the frequency of occurrence of the previously evaluated UFSAR accident. UFSAR section 5.2.3.7 states that the RCS is protected against overpressure by the pressurizer code safety valves. This section also states that the pressurizer PORV has a dual setpoint and that during normal operation the lift setpoint is 2450 psig. UFSAR section 5.4.6 states that overpressure protection consists of two code safety valves and one electromatic relief valve. In addition Technical Specification 2.1.2 bases state that the code safety valves provide overpressure protection with respect to the RCS pressure safety limit and no credit is taken for the PORV. If the pressurizer vent line is inoperable, then either or both the PORV and the PORV block valve are inoperable from the the perspective of not being open or able to be opened. Since the code safety valves are credited for accident mitigation then operability of the PORV and PORV block valve from the standpoint of providing a vent path does not affect the frequency of occurrence of an accident previously evaluated in the UFSAR. The pressurizer vent path is to provide system pressure and volume control by removing non-condensible gases. The PORV is normally closed and is automatically operated in response to RCS system pressure signals. The block valve is a normally open motor operated valve. In order for the vent path to perform its intended safety function of venting, the PORV block valve in the flow path must be open or capable of being opened and the PORV must be capable of being opened. If the block valve is not open or capable of being opened or the PORV is closed and not capable of being opened then the vent path is inoperable since it would be blocked (not pass flow). If either of these valves is closed then the RCS pressure boundary is maintained. As described above, the SLC's purpose for the PORV and PORV block valve with respect to the vent path are not associated with the RCS pressure boundary function. Therefore, the SLC change is not resulting in an increase in frequency of occurrence of a LOCA. Thus, the SLC change does not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the UFSAR.

SLC 16.5.1 addresses the RCS vent paths. One of these paths is the pressurizer steam space vent path. This vent path has a design function to vent noncondensible gas from the pressurizer. The bases to SLC 16.5.1 provides information that venting of the pressurizer is required to assure its availability for system pressure and volume control and that this is an important consideration, especially during natural circulation. The bases also include information that "The block valve is a normally open motor operated valve. The PORV is normally closed and is automatically operated in response to RCS system pressure signals. In order for the vent path to perform its intended safety function of venting, the PORV block valve in the flow path must be open or capable of being opened and the PORV must be capable of being opened." Based on this wording, SLC 16.5.1 is addressing the operability of the vent path function of the pressurizer steam space vent path to open to pass flow to eliminate noncondensible gases. This SLC is not addressing the closing function of the block valve or pressurizer PORV. The pressurizer steam space vent (through the PORV) contains the PORV and the PORV block valve. The PORV block valve has a design function to be open or be capable of being opened to vent the pressurizer. The PORV block valve has a function to close to prevent pressurizer steam space blowdown if the PORV fails to reclose after being actuated. The PORV block valve is used to assist in isolating the RCS when the SSF is utilized to mitigate accidents. The PORV has a design function of needing to open to provide the vent path. The safety evaluation addressing NUREG 737 Item II.B.1 states that the NRC staff does not require the PORV and associated block valve to be seismically qualified or environmentally qualified

(EQ) as recommended by Item 10 of Action II.B.1 because the PORV is considered to be redundant to the reactor vessel head and hot leg vents. It also has design functions to assist in providing RCS overpressure protection, along with the pressurizer code safety valves. However TS 2.1.2 states that no credit is taken for operation of the PORV to ensure that the RCS pressure safety limits will not be exceeded. The PORV provides overpressure protection during normal operations with a setpoint of 2450 psig and has a lower lift setpoint which is used during start-up and shutdown conditions. This lower setpoint is used to prevent the LTOP pressure limits from being exceeded. The PORV is part of one of the LTOP trains. The PORV is also used to provide for venting of the pressurizer to assure its availability for RCS pressure and volume control. SLC 16.5.1 addresses the RCS vent paths. The SLC change involves a change to lengthen the allowed completion time to restore operability of the pressurizer steam space vent (though the PORV). This SLC does not address the overpressure protection function of the PORV, so that is not a design function for the PORV for this change. The SLC is also not addressing any isolation capabilities of the PORV block valve, so isolation capability is not a design function for this change. This determination is based on information in the bases of the SLC which does not address any block valve closing requirement. The bases also do not address any automatic actuation to provide overpressure protection. The bases to the SLC address that the block valve must be open or capable of being opened and the PORV must be capable of being opened. This statement provides information that the closing is not the design function related to the SLC. The SLC is also not addressing any LTOP function. The design function is to provide a pressurizer steam space vent path through the pathway that contains the PORV. If this pathway is not available then the venting of non-condensible gases via this pathway would be unavailable.

NEI 96-07 Revision 1, which was endorsed by the NRC in Regulatory Guide 1.187, provides information that an appropriate calculation can be used to demonstrate the change in likelihood in a quantitative sense, if available and practical. NEI 96-07 includes information that a more than minimal increase in likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated would exist if the change in likelihood of occurrence of a malfunction is calculated in support of the evaluation and increases by more than a "factor of two". Clarifying information is included that the "factor of two" should be applied at the component level. Based on this information, if the change does not cause a more than a "factor of two" increase, it is not more than minimal for this question's response. A request for support in answering the increase due to the completion time change was made to the Duke Energy Probabilistic Risk Assessment (PRA) Group. This request was made to assist in ensuring that a simplistic approach of looking at the malfunction due to doubling the completion time was acceptable. A calculation was performed by the PRA Group and documented to determine the increase in likelihood for the PORV vent path and its components to not perform its design functions with respect to the SLC change. The PRA calculation included the following "The pressurizer vent path is a standby function which is not normally operating (venting). Therefore, the likelihood of it failing to perform its intended function is composed of two basic parts, the unreliability (failure probability per demand) to open the vent path and the unavailability of the path. Changing the length of time that the path can be inoperable from 30 days to 60 days has no impact on the demand reliability of the components needed to accomplish the function, but it directly impacts the potential unavailability of the vent path to provide this function. Unavailability of the vent path may occur, for example, if the vent path is removed from service for routine or corrective maintenance or if a design deficiency is identified that causes the vent path to be declared

inoperable." The conclusion was that there was not more than a "factor of two" increase. Justification from the PRA Group calculation was as follows:

The change does impact the availability of the vent path to provide its design function associated with this SLC. Since the proposed 60 day completion time is only two times the current approved completion time, the likelihood of a malfunction of the vent path would not increase by more than a factor of two and therefore does not result in a more than minimal increase in the likelihood of a malfunction of an SSC important to safety. In the same manner, the likelihood of a malfunction of other functions provided by the Pressurizer PORV and vent path (outside of this SLC or other TSs) whose availability may be indirectly impacted by this change would also not increase by more than a factor of two and therefore not result in a more than minimal increase in the likelihood of a malfunction of an SSC important to safety. Thus, the SLC change does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the UFSAR.

The existing SLC addresses a time frame that the PORV vent path can be inoperable. UFSAR Section 5.4.6.5 addresses the PORV effluent is discharged into the Quench Tank. There is no modification to the pressurizer PORV, the other RCS vents, or any other system, structure, or component with the revision to SLC 16.5.1. Any dose consequence of an accident that could occur due to the PORV vent path being inoperable for 30 days would be the same dose consequence for 60 days. Thus, there is not more than a minimal increase in the consequences of an accident previously evaluated in the UFSAR.

The existing SLC addresses a time frame that the PORV vent path can be inoperable. UFSAR Section 5.4.6.5 addresses the PORV effluent is discharged into the Quench Tank. There is no modification to the pressurizer PORV, the other RCS vents, or any other system, structure, or component with the revision to SLC 16.5.1. Any dose consequence of a malfunction of the PORV vent path and the RCS pressure boundary for 30 days would be the same dose consequence for 60 days. Thus, there is not more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the UFSAR.

The current SLC 16.5.1 Condition A addresses one RCS vent path being inoperable for 30 days or begin shutting down the unit(s). The change is to allow the RCS vent path via the PORV to be inoperable for more time. Since the existing SLC condition allows for the PORV vent path to not perform its SLC specified design functions, any accident created by the PORV vent path components not performing their function and creating an accident would already exist (e.g., LOCA). Thus, the SLC change does not create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR. Thus, the SLC change does not create a possibility for an accident of a different type than previously evaluated in the UFSAR.

The current SLC 16.5.1 Condition A addresses one RCS vent path being inoperable for 30 days or begin shutting down the unit(s). The change is to allow the RCS vent path to be inoperable for more time. Since the existing SLC condition allows for the PORV vent path to not perform its SLC specified design functions, the malfunction of the PORV vent path components and RCS pressure boundary already exist. The extension of time does not add any new malfunction. Only the likelihood of the malfunction has changed, which is addressed under the response to

question 2. Thus, the SLC change does not create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR.

The fission product barriers are the fuel pellet, cladding, reactor coolant pressure boundary, and containment. This activity does not modify a fission product barrier, nor does this activity affect a controlling numerical value for a parameter established during the licensing review as presented in the UFSAR for a parameter used to determine the integrity of a fission product barrier. The activity does change the committed time requirement for shutting down if the PORV vent path is not operable, but this change does not change any design basis limits for the RCS boundary itself. Thus, the SLC change does not result in a design basis limit for a fission product barrier as described in the UFSAR being exceeded or altered.

Duke calculation OSC-10795 was developed for this activity for risk assessment, however it does not involve a method of evaluation described in the UFSAR. This activity does not revise a computer code or calculation that is described in the UFSAR. It also does not change a design or analysis code described in the UFSAR. Thus, the activity does not involve a change in a method of evaluation described in the UFSAR. Thus, the SLC change does not result in a departure from a method of evaluation in the UFSAR.