Duke Energy®

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

Duke Energy
ONO1VP / 7800 Rochester Hwy.
Seneca, SC 29672

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

November 15, 2010

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 Operate a Reverse Osmosis System to Remove Silica from the Borated Water Storage Tanks and Spent Fuel Pools during Unit Operation
License Amendment Request (LAR) No. 2010-03

In accordance with Title 10, Code of Federal Regulations, Part 50, Section 90 (10 CFR 50.90), Duke Energy Carolinas, LLC (Duke Energy) proposes to amend Renewed Facility Operating Licenses Nos. DPR-38, DPR-47, and DPR-55 for Oconee Nuclear Station (ONS), Units 1, 2, and 3. Duke Energy requests the Nuclear Regulatory Commission (NRC) to review and approve design features and controls that will be used to ensure that operation of a Reverse Osmosis (RO) system during Unit operation does not significantly impact the Borated Water Storage Tank (BWST) or Spent Fuel Pool (SFP) function or other plant equipment. Periodic limited operation of a RO system during Unit operation is needed to remove silica from each Oconee Units' BWST and SFP.

SFP storage racks containing Boraflex were licensed and installed in the early 1980's to maximize fuel packing density. The silica in the SFP is the result of Boraflex degradation caused by gamma irradiation. Subsequently, in the early 2000's, to account for this Boraflex degradation, Duke Energy proposed and the NRC approved crediting soluble boron in the criticality analysis to allow the neutron absorbing Boraflex material in the fuel storage racks to not be credited. However, the Boraflex remains installed in the SFP storage racks and continues to degrade and release silica into the SFP. Due to the mixing of the water between the SFP, BWST, and Reactor Coolant System (RCS) during refueling, the SFP, BWST, and the RCS all have silica concentrations greater than desired. Present silica levels at ONS exceed vendor recommended levels but do not present a risk to fuel integrity or performance. In addition, the elevated RCS silica levels prevent ONS from increasing the RCS lithium concentration, which with current boron levels would allow operation at a higher RCS pH. This higher RCS pH would lower the generation and activation of corrosion products in the RCS.

Silica removal is also desired to support transition from the current 18-month fuel cycle to a 24-month fuel cycle (reference Duke Energy ONS LAR dated May 6, 2010). The ability to

A001
NRR

increase the RCS lithium concentration to lower the generation and activation of corrosion products is increasingly important with the longer fuel cycle.

The enclosure provides the technical justification for periodic limited operation of the RO System during Unit operation. Duke Energy evaluated the effect of potential failures and identified precautionary measures that must be taken before and during RO System operation, and required operator actions to protect affected structures, systems, and components. This evaluation concluded that periodic limited RO System operation during Unit operation does not have a significant impact on safety.

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

Duke Energy requests that this proposed license amendment be reviewed and approved by May 31, 2011. Approval by this date will allow Duke Energy to operate the RO System a sufficient amount of time to adequately reduce silica concentration in the Unit 2 BWST and Unit 1 and 2 SFP prior to the first Oconee Unit transitioning to a 24-month fuel cycle during the Unit 2 Fall, 2011 refueling outage. Duke Energy will update applicable sections of the ONS Updated Final Safety Analysis Report (UFSAR), as necessary, and submit these changes in accordance with 10 CFR 50.71(e). Proposed changes to the UFSAR are described in the Enclosure. There are no new commitments being made as a result of this proposed change.

Inquiries on this proposed amendment request should be directed to Boyd Shingleton of the ONS Regulatory Compliance Group at (864) 873-4716.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 15, 2010.

Sincerely,

T P Gillespie

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

Enclosure:
Evaluation of Proposed Change

bc w/enclosure:

Mr. Luis Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Mr. John Stang, Project Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop O-8 G9A
Washington, D. C. 20555

Mr. Andy Sabisch
Senior Resident Inspector
Oconee Nuclear Site

Ms. Susan E. Jenkins, Manager
Radioactive & Infectious Waste Management
Division of Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201

ENCLOSURE

EVALUATION OF PROPOSED CHANGE

Subject: License Amendment Request for Approval to Operate a Reverse Osmosis System to Remove Silica from the Borated Water Storage Tanks and Spent Fuel Pools during Unit Operation

1. SUMMARY DESCRIPTION
2. DETAILED DESCRIPTION
   2.1 Reverse Osmosis Modification
   2.2 UFSAR Change Description
   2.3 TS Discussion
3. TECHNICAL EVALUATION
   3.1 Planned Operating Duration and Frequency of the RO System
   3.2 Evaluation of Postulated Pipe Rupture in High Energy Portions of the RO System
   3.3 Evaluation of Impact to SFP
   3.4 Evaluation of Impact to the BWST
   3.5 Evaluation of Impacts due to Auxiliary Building Flooding
   3.6 Evaluation of Potential Release of Radioactivity
   3.7 Summary
4. REGULATORY EVALUATION
   4.1 Significant Hazards Consideration
   4.2 Applicable Regulatory Requirements/Criteria
   4.3 Precedent
   4.4 Conclusions
5. ENVIRONMENTAL CONSIDERATION
6. REFERENCES

1.0 SUMMARY DESCRIPTION

Duke Energy is in the process of installing a Reverse Osmosis (RO) system to remove silica from the Oconee Nuclear Station (ONS) Units 1, 2, and 3 Borated Water Storage Tanks (BWSTs) and Spent Fuel Pools (SFPs). As a part of this process, Duke Energy determined that operating the RO System during Unit operation requires Nuclear Regulatory Commission (NRC) approval. As such, Duke Energy requests the Nuclear Regulatory Commission (NRC) to review and approve design features and controls that will be used to ensure that operation of a Reverse Osmosis (RO) system during Unit operation does not significantly impact the Borated Water Storage Tank (BWST) or Spent Fuel Pool (SFP) function and other plant equipment. Periodic limited operation of a RO system during Unit operation is needed to remove silica from each Oconee Units' BWST and SFP.

SFP storage racks containing Boraflex were licensed (Reference 1) and installed in the early 1980's to maximize fuel packing density. The silica in the SFP is the result of Boraflex degradation caused by gamma irradiation. Subsequently, in the early 2000's, to account for this Boraflex degradation, Duke Energy proposed (Reference 2) and the NRC approved (Reference 3) crediting soluble boron in the criticality analysis to allow the neutron absorbing Boraflex material in the fuel storage racks to be ignored. However, the Boraflex remains installed in the SFP storage racks and continues to degrade and release silica into the SFPs. Due to the mixing of the water between the SFP, BWST, and Reactor Coolant System (RCS) during refueling, the SFP, BWST, and the RCS all have silica concentrations greater than desired. Present silica levels at ONS exceed vendor recommended levels but do not present a risk to fuel integrity or performance. In addition, the elevated RCS silica levels prevent ONS from increasing the RCS lithium concentration, which with current boron levels would allow operation at a higher RCS pH. This higher RCS pH would lower the generation and activation of corrosion products in the RCS.

Silica removal is also desired to support transition from the current 18-month fuel cycle to a 24-month fuel cycle (Reference 4). The ability to increase the RCS lithium concentration to lower the generation and activation of corrosion products is increasingly important with the longer fuel cycle.

Duke Energy has identified potential failures of the RO System and actions that must be taken to protect affected structures, systems, and components (SSCs) important to safety. Duke Energy evaluated the effect of potential failures and identified precautionary measures that must be taken before and during RO System operation, and required operator actions to protect the affected SSCs. This evaluation concluded that RO System operation, as described in this enclosure, does not have a significant impact on safety.

Duke Energy requests that this LAR be reviewed and approved by May 31, 2011. Approval by this date will allow Duke Energy to operate the RO System a sufficient amount of time to adequately reduce silica concentration in the Unit 2 BWST and Unit 1 and 2 SFP prior to the first Oconee Unit transitioning to a 24-month fuel cycle (Unit 2 Fall, 2011 refueling outage).

There are no new commitments being made as a result of this proposed change.

Background

The BWST supports the Emergency Core Cooling System (ECCS) and the Reactor Building Spray (RBS) System by providing a source of borated water for ECCS and RBS pump operation. In addition, the BWST supplies borated water to the refueling canal for refueling operations.

There are two phases of ECCS operation: injection and recirculation. In the injection phase, all injection is initially added to the RCS via the cold legs or Core Flood Tank (CFT) lines to the reactor vessel. After the BWST has been depleted, the recirculation phase is entered as the suction is transferred to the reactor building emergency sump (RBES).

The Technical Specification (TS) required BWST volume is ≥ 350,000 gallons. Sufficient deliverable volume must be available during a loss of coolant accident (LOCA) prior to the transfer to the RBES for recirculation.

The minimum required BWST volume is also needed to support continued Low Pressure Injection (LPI) pump operation after the manual transfer to recirculation occurs. When LPI pump suction is transferred to the sump, there must be sufficient water in the sump to ensure adequate net positive suction head (NPSH) for the LPI and RBS pumps. The amount of water that enters the sump from the BWST and other sources is one of the input assumptions of the NPSH calculation. Since the BWST is the main source that contributes to the volume of water in the sump following a LOCA, the calculation does not take credit for more than the minimum volume of usable water from the BWST.

The High Pressure Injection (HPI) System is credited in the small break loss of coolant accident (SBLOCA) analysis. This analysis establishes the minimum required flow and discharge head requirements at the design point for the HPI pumps, as well as the minimum required response time for their actuation. The Steam Generator Tube Rupture (SGTR) and Main Steam Line Break (MSLB) analyses also credit the HPI pumps, but these events are bounded by the SBLOCA analyses with respect to the performance requirements for the HPI System. The HPI System is not credited for mitigation of a large break loss of coolant accident (LBLOCA).

The minimum water level in the SFP is consistent with the assumption of iodine decontamination factors following a fuel handling or cask drop accident. The water also provides shielding during the movement of spent fuel. The minimum SFP boron concentration allows sufficient time to detect and mitigate all credible boron dilution scenarios and is available for all accident conditions evaluated in the SFP rack and dry storage canister criticality analyses, per the double contingency principle.

The SFP is also used as a source of borated water for the Standby Shutdown Facility (SSF) Reactor Coolant (RC) Makeup System. The SSF is designed to maintain the reactor in a safe shutdown condition following postulated fire, sabotage, and flooding events. On loss of normal makeup to the RCS, the SSF RC makeup system uses the SFP to provide RC Pump Seal cooling and makeup to the RCS. The SSF is also credited as the alternate AC power source and the source of decay heat removal required to demonstrate safe shutdown during the required station blackout coping duration.

Although not fully protected from tornadoes, the SSF RC Makeup Pump taking suction from the SFP and an HPI Pump taking suction from either the BWST or the SFP, provide reasonable assurance that a sufficient supply of primary side makeup water is available during a tornado initiated loss of offsite power.

During the time period directly after an outage, the Unit 1 & 2 SFP level is required to be maintained above the TS Limiting Condition for Operation (LCO) 3.7.11 limit to support TS LCO 3.10.1 (Standby Shutdown Facility) operability requirements for the SSF RC Makeup System due to the additional decay heat from the recently offloaded spent fuel. The Unit 3 SFP does not have this requirement.

Reverse Osmosis Process

The RO unit is contained on a skid and located in the Unit 2 Pipe Trench Area Room. Water piped to the RO unit from the selected source (BWST or SFP) first encounters the Feed Booster Pump on the RO unit. The pump provides low Net Positive Suction Head (NPSH) for suction lift of the water from the selected sources that are either a distance from the RO unit or have piping restrictions of some sort (orifices or small diameter/long length). This pump increases the suction pressure going to the Feed Pump to ensure sufficient NPSH for this pump. The water passes through a particulate filter that protects the RO filters/membranes from clogging. The Feed Pump is a high pressure, high speed, single stage 40 hp pump that can provide approximately 600 psig of pressure needed to force water against the membranes so that the desired process flow can be obtained. The flow is controlled with a manual throttle valve downstream of the Feed Pump and upstream of the membranes. When the flow reaches the membranes, it is piped in series across multiple banks of membranes. The membranes are specially designed to resist the passage of dissolved silica and to enhance the passage of boric acid solution. The "effluent", or processed flow, is collected in parallel on the other side of the membranes. A certain amount of "reject" flow is manually set. Reject flow is a remnant of the supply flow to the membranes, and is set to as low a value as feasible within parameters provided by the manufacturer of the RO unit. Its purpose is to flush and remove/reject the concentrated silica across the faces of the membranes so that the concentration of silica does not reach levels that will allow it to plate out on the filters, thus either damaging or destroying them. The reject flow is taken from the high pressure side of the membranes and contains the silica removed from the flow and the boric acid that does not pass through the membranes. The reject flow is routed to the Miscellaneous Waste Holdup Tank (MWHUT) in the Auxiliary Building. The effluent is collected and returned to the source from which it was taken. The reject flow is routed through an "antimony capture vessel", which contains a special resin to remove antimony from the waste stream. Antimony removal assists in processing of the waste stream.

2.0 DETAILED DESCRIPTION

2.1 Reverse Osmosis Modification

The RO System, which has non-Quality Assurance Condition 1 (QA-1) Duke Energy Class E (USAS B31.1.0, non-seismic) piping, except as described below, consists of an RO unit and supply and return piping from the BWSTs and SFPs. The RO unit is located in the Unit 2 Pipe Trench Area Room (Room 349) directly below the Unit 2 West Penetration Room (WPR). A single RO unit will be shared by all three ONS units. The RO unit is powered from a non QA-1 Unit 1 power source. The RO unit will be capable of being aligned to the Unit 1&2 SFP, the Unit 3 SFP, the Unit 1 BWST, the Unit 2 BWST, or the Unit 3 BWST. New RO System piping and existing Spent Fuel (SF) Purification Loop piping are used for these alignments.

New RO System supply piping is routed from the Unit 1 & 2 SFP to the RO unit. To establish a path from the Unit 1 and Unit 2 BWSTs, new RO System piping is connected to the Unit 1 & 2 SF Purification Loop (QA-1, Duke Energy Class C - USAS B31.7, seismic). The new branch line begins as Class C and contains a new Class C seismic boundary valve (Units 1 & 2 share a common boundary valve) before changing to Class E. The piping remains Class E, with the exception of the portion that passes through the Hot Machine Shop, to the RO unit. The piping in the Hot Machine Shop is non-QA-1, seismic Class D, USAS B31.1.0.

New RO System Duke Energy Class E piping (a portion is Class D) is routed from the Unit 3 SFP to the RO unit in Unit 2 Room 349. The piping that passes through the Unit 3 Ventilation Equipment Room that is below the SFP water level and the WPR is Class D. The Unit 3 BWST is connected to this line via a branch line from the Unit 3 SF Purification loop (Duke Energy Class C). The branch line begins as Class C and contains a new Class C seismic boundary valve before changing to Class E.

The return piping from the RO unit is routed back to the purification portion of the SF Cooling Systems (Units 1&2 and Unit 3). The RO System return piping is Class E up to the point where connections are made to the SF purification piping. An isolation valve and a check valve are installed in series in each of the return lines to the SF purification piping. The check valve and its downstream piping are classified as Class C. The location where the discharge piping connects to the purification loop is such that the return flow can be aligned to the same source supplying the RO unit.

The suction piping from each SFP is designed as a "candy cane" that is inserted into the water above the pool. Although the "candy cane" piping is Class E, it is seismically supported so that it will not fall into the SFP. Priming of the "candy cane" is required to start the flow from the SFP to the RO unit. The piping for the SFP suction inlet does not extend below the required minimum SFP water level specified in TS LCO 3.7.11 to ensure the TS level is not reached due to the use of the RO System.

The BWST water is routed to the RO System from the SF purification loop. This connection is at a lower elevation than the BWST so a break in the RO System piping will cause the BWST to drain if not isolated. Operator action is credited to isolate an RO System piping break as described in Sections 3.4 and 3.5 below.

The RO unit is designed to concentrate and reject silica from water while recovering boric acid to the maximum extent possible. In the RO process, when pressure is applied to a solution on one side of a semi-permeable membrane, some minerals, salts, and colloidal solids are unable to pass through the membrane and are rejected, while the remainder of the solution passes through the membrane and is collected for return to the system. Procedural controls will be used to maintain the reject flow rate, which is adjustable, within analyzed bounds.

Water from the BWSTs or the SFPs will be sent to the RO unit and the majority of the water will be returned to the respective supply source (reject flow with the removed silica and boron will not be returned). Only one BWST or SFP will be aligned to the RO System for treatment at a time. The removal rate (reject flow) is a setting on the unit. The water not returned to the originating source will be routed to the MWHUT. This reject flow piping is classified as Duke Energy piping Class E. The water that is returned to the source will be at a slightly lower boron concentration.

The RO unit is also connected to de-mineralized water and service air. De-mineralized water is used to assist in establishing the siphon from the SFP to start the flow from the SFP to the RO unit. The de-mineralized water is not borated so its use slightly dilutes the SFP water. Service air is used for maintenance activities.

2.2 UFSAR Change Description

The proposed changes to the Updated Final Safety Analysis Report (UFSAR) related to the use of the RO are described below:

UFSAR Section 3.1.4, Sharing of Systems, specifies that reactor facilities shall not share systems or components unless safety is not impaired by the sharing. Duke Energy's evaluation concluded that safety is not impaired by sharing the RO System between ONS Units 1, 2, and 3. The table, which lists shared systems that do not impair safety, will be revised to list the RO System as shared between Units 1, 2, and 3.

UFSAR Section 3.4.1.1.1, Current Flood Protection Measures for the Turbine and Auxiliary Buildings, will be revised to indicate that the RO System is considered a new source that, if not isolated, could flood the Auxiliary Building if the non-seismic piping ruptured. Note: The approved licensing basis (Reference 5) for Flood Protection Measures for the Turbine and Auxiliary Buildings, adds a paragraph that addresses Auxiliary Building flooding from three sources. This information is to be added to the UFSAR; however, the UFSAR has not been updated to reflect this approval. The new source will be added to this paragraph.

UFSAR Section 3.6.1, Postulated Piping Failures in Fluid Systems Inside and Outside Containment, will be revised to list the new RO System as a high energy system outside containment that has been evaluated for its affects on SSCs important for safety based on approval of this LAR.

UFSAR Table 3-2 provides the system component classification. This table will be revised as appropriate to include RO System components.

UFSAR Section 9.1.3, Spent Fuel Cooling System, will be revised, as appropriate, to include an RO System description and associated analysis.

A new table will be added to UFSAR Chapter 9 for RO System Data. The new table will describe some of the major components.
UFSAR Figure 9-5, Spent Fuel Pool Cooling, will be revised to show connections to and from the RO System.

2.3 TS Discussion

TS 3.5.4 Surveillance Requirement (SR) 3.5.4.2 and SR 3.5.4.3 requires verification of BWST volume and BWST boron concentration every 7 days, respectively. TS SR 3.7.11.1 requires verification of SFP water level every 7 days. TS SR 3.7.12.1 requires verification of SFP boron concentration every 7 days. TS SR 3.5.4.1 requires verification of BWST temperature every 24 hours when ambient air temperature is < 45°F or > 115°F.

TS SR 3.5.4.1 is modified by a Note that requires the Surveillance to be performed only when ambient air temperatures are outside the operating temperature limits of the BWST. The TS bases for this SR provide information that with ambient temperature within this band, the BWST temperature should not exceed the limits. Currently, batch additions can be made to the BWST which could affect the BWST temperature. There is no additional SR to address these batch additions for effects on the BWST's temperature. NUREG-1430, Standard Technical Specifications for Babcock & Wilcox Plants (Reference 6), does not contain an additional SR to require additional monitoring of the BWST temperature during batch additions. These batch additions are currently controlled by procedures. Purification of the BWSTs is also controlled by procedure. This procedure requires SF inlet temperature to be maintained at less than a specified temperature during BWST purification. The NUREG also does not contain a TS SR for purification. Since the RO process also adds heat to the water being purified, similar controls are proposed without requiring a new TS SR.

The bases for TS SR 3.5.4.2, TS SR 3.5.4.3, and TS SR 3.7.11.1 indicate that the 7 day frequencies are based on the volumes of the BWST and SFP being normally stable. The bases for TS SR 3.7.12.1 indicate that the 7 day frequency is considered appropriate because no major replenishment of pool water is expected to take place over a short period of time. The RO process rejects some water that must be made up to the source being processed as well as returning slightly lower borated water to the BWST or SFP being treated. As described above, batch additions are currently made to the BWST, as well as to the SFP, which could affect their volume or boron concentration. There are no additional SRs to address these batch additions for effects to the volume/level or boron concentrations. NUREG-1430 also does not contain an additional SR to require additional monitoring of the BWST or SFP volume/level or boron concentrations during batch additions. These batch additions are currently controlled by procedures. Purification of the SFPs and BWSTs are also controlled by procedure. This procedure requires boron concentration and volume be maintained within TS limits during SFP or BWST purification. For the RO process, similar controls are proposed without requiring new SRs. ONS procedures will require more frequent monitoring of boron concentration and volume to verify the required TS limits continue to be met during RO System operation. The batch additions to make up for reject flow are expected to be no more than 10% of the volume before sampling the contents is required. The return flow is not considered as a replenishment of pool water since it is returning existing SFP water, albeit at a slightly lower boron concentration.

3.0 TECHNICAL EVALUATION

The RO System is primarily a non-QA1, non-seismic system. The system will be operated at temperatures below 200°F. However, portions of the RO System will operate in a high pressure condition (i.e., >275 psig). Therefore, those portions of the system that operate above 275 psig are classified as high energy piping and fall within the scope of UFSAR Section 3.6 (Protection Against Dynamic Effects Associated with the Postulated Rupture of Piping).

The RO System is shared by all three ONS units. It is not required to operate to mitigate the consequences of any design basis events or accidents. The RO System is powered from a non QA-1, non-load shed power supply on Unit 1. The RO System will automatically shut down following a loss of power and requires manual operator action to restart. The RO System has interconnections with safety related components (i.e., piping associated with the BWSTs and the SFPs). The continued operation of the RO System has the potential to adversely affect the BWSTs or the SFPs with effects including inventory loss or reduced boron concentration if the RO process is not stopped. In addition, ruptures in RO System piping could lead to a loss of inventory from the BWSTs or SFPs (depending on the system alignment).

The RO System is being located inside the Auxiliary Building. Therefore, ruptures in RO System piping also create a new source of flooding inside the Auxiliary Building. Some portions of the suction piping from the SFPs to the RO System are routed through areas of the Auxiliary Building where the liquid waste system would not be assured of collecting the loss of inventory from the SFPs. Duke Energy also evaluated potential releases of radioactive liquid to the environment due to RO System piping failures.

The evaluation of these potential adverse effects is provided below.

3.1 Planned Operating Duration and Frequency of the RO System

The RO System will be operated as discussed below to reduce silica levels in the SFPs and the BWSTs. The RO System can be aligned to any of the following, with the restriction that only one may be aligned at any given time:

- Unit 1 BWST
- Unit 2 BWST
- Unit 3 BWST
- Unit 1&2 SFP
- Unit 3 SFP

The cumulative time the RO System is aligned to each unit's BWST and each SFP will be limited to less than 10% of an operating cycle for the initial silica removal. The cumulative time does not need to be consecutive and can be accrued in portions of days, hours and minutes. Since the Unit 1 BWST and the Unit 2 BWST use a common seismic boundary valve in their flow paths to the RO unit, the cumulative time of RO System operation for the Unit 1 BWST and Unit 2 BWST combined will be limited to less than 10% over the course of consecutive Unit 1 and 2 operating cycles. The Unit 3 BWST also has a seismic boundary valve in its flow path to the RO unit. For Unit 3, the cumulative time of RO System operation will be limited to less than 10% of the Unit 3 operating cycle. The maximum time needed for silica removal for the subsequent fuel cycle cleanups is expected to be reduced significantly after the initial cleanup since the silica concentration will be reduced. ONS procedures will include restrictions regarding the cumulative time that the RO System can be aligned to the BWSTs and SFPs over an operating cycle as well as a maximum time period the RO System can be continuously operated prior to verifying (with adjustment as necessary) boron concentration, volume, and temperature are within TS limits. These procedures will also require the water level and boron concentration to be increased, as necessary, prior to RO System operation to ensure TS limits will be met at the end of any RO System process period. Additionally, ONS procedures will prohibit RO System operation (i.e., RO System will be isolated from the Unit 1 & 2 SFP) during the time period directly after an outage when the SFP level is required to be maintained above the TS LCO 3.7.11 level requirement to support TS LCO 3.10.1 operability requirements for the SSF RC Makeup System. The Unit 3 SFP currently does not have a similar requirement.

UFSAR Section 3.7.3.9, Interaction of other Piping with Piping Designed for Seismic Conditions, states that it is acceptable to open normally closed manual seismic boundary valves provided the opening and closing of these valves is controlled by approved plant procedures and the valve will be opened for a required operating evolution with a clearly definable beginning and end time. The expectation is that, when the associated safety system is required to be operable, the manual seismic boundary valve will be in the closed position much more than it is in the open position. As described above, the seismic boundary valve that isolates non-seismically qualified RO System piping from seismically qualified SF Purification system piping meets the criteria for a normally closed manual seismic boundary valve. Since no exception is made, no changes to UFSAR Section 3.7.3.9 are necessary.

3.2 Evaluation of Postulated Pipe Rupture in High Energy Portions of the RO System

The only high energy piping associated with the RO System is contained on the RO skid. The RO unit is located inside Room 349. Ruptures were postulated on all high energy piping exceeding 1-inch nominal pipe size. There were no direct effects resulting from pipe whips or jet impingements on equipment needed for safe shutdown. Since this is a cold water system, there are no postulated environmental effects (pressure, temperature and humidity) on electrical equipment. However, pipe ruptures result in a potential for flooding of areas inside the Auxiliary Building. The consequences of flooding are addressed in Section 3.5 below.

3.3 Evaluation of Impact to SFP

One SFP is shared between ONS Units 1 & 2, and a separate SFP is provided for ONS Unit 3. The SFPs provide for the safe storage of spent fuel as well as act as a source of borated water for use by the SSF RC Makeup system. The SFP also acts as a backup suction source for the associated unit's HPI system following events that result in a loss of the BWST (i.e., tornado damage).

The SFPs are currently designed to withstand tornado and seismic loads. Most of the RO System and its associated piping are not designed to withstand seismic loading. In addition, some piping from the Unit 1 & 2 and Unit 3 SFPs to the RO System is routed in areas of the Auxiliary Building that are not designed to withstand loads imposed by a tornado. Administrative controls will be in place to shutdown and isolate the RO System from the SFPs when ONS is placed under a tornado watch or warning since water from a rupture can be released outside the Auxiliary Building.

A High Energy Line Break (HELB) in the RO unit or a postulated break in non seismic portions of the RO System would result in Auxiliary Building flooding and impact to the SFP inventory. The effects of Auxiliary Building flooding are addressed in Section 3.5.

RO System operation when aligned to the SFP also creates new concerns for SFP deboration as well as reduced SFP level. The return flow from the RO System to the SFP will be of lower boron concentration. During normal operation, a small amount of water inventory is rejected to the waste system. The normal reject flow from the RO System will result in reduced SFP water inventory. Since portions of the RO System will operate in a high energy condition, any ruptures in the high energy portion will result in a loss of some SFP water inventory. However, a postulated failure in the RO System piping will not drain the SFP below the minimum TS required water level since the piping for the SFP suction inlet does not extend below this level.

The potential adverse condition for deboration of the SFP is addressed by procedural controls. Duke Energy will use procedural controls to ensure correct suction/discharge alignment and to ensure boron concentration in the SFP are maintained within TS limits during operation of the RO System during normal Unit operations. The SFP boron concentration will be increased, as necessary, prior to RO System operation to compensate for boron dilution caused by operation of the RO System during normal Unit operations. The SFP volume will be increased to compensate for the water rejected during RO operation (the reject flow is a manual setting on the RO unit). Time restrictions will be placed on RO System operation to limit the amount of time the system can be operated before boron concentration or level adjustment is required.

Manual action will be required to stop the RO System operation to prevent further deboration effects on the SFP, following events that rely upon the SFP for event mitigation. These events are discussed in the following paragraphs.

The specified SFP water level preserves the assumptions of the fuel handling and cask drop accident analyses. As such, the SFP is at or above the minimum level required for fuel storage and movement within the SFP or movement of the cask over the SFP. The SFP is also the source of borated water for SSF RC Makeup. The SSF is not required to mitigate a LOCA so there is no need to shutdown the RO System to avoid deboration for this reason. However, since the TS requirement for the SFP boron concentration would still be required to be met for spent fuel and to mitigate an SSF event, the RO unit will eventually need to be shutdown.

The SFP is not used to mitigate a LOCA. A LOCA will not impact the SFP water level. If the RO unit is operating and a LOCA or an SSF event occurs, the RO unit will continue to operate until shut off or enough water is rejected to lower the SFP level to below the suction pipe. Continued operation of the RO unit could eventually de-borate the SFP water below the TS limit. Procedural controls will be used to ensure the required boron concentration is maintained by shutting down the RO unit or closing a valve.

Continued RO System operation (normal operation or following pipe ruptures) will not reduce the water level below the TS limit because the design of the suction piping will not permit continued suction from the SFP. The "candy cane" design of the suction piping that is inserted into the water from the top of the SFP will break suction on the piping prior to going below the TS limit. Therefore, no operator action is required to conserve SFP inventory.

The RO unit is located in Unit 2 Room 349. Access to the RO unit due to higher radiation levels is an issue only in the event of a LOCA on Unit 2. This is because of the proximity of the RO unit to the ONS Unit 2 Reactor Building. If the RO unit is operating and aligned to the Unit 1 & 2 SFP or Unit 3 SFP when a LOCA occurs on Unit 2 or an SSF event occurs, the impact to the affected SFP depends on the reject flow rate and the boron concentration and level of the SFP at the time of the LOCA or SSF event. The worst case initial condition is when the silica level is high (only when the RO unit is placed into operation the first time) and the maximum time has been reached that the RO unit was intended to be shut down (procedural controls used to adjust boron concentration and water level). The durations will vary, but in the event of a LOCA, ONS's licensing basis does not assume a simultaneous pipe break due to a seismic event or HELB. Therefore the RO unit could operate until the boron concentration or SFP level became unacceptable. Since the level is self limiting by the depth of the suction pipe, the only issue is the boron concentration. Adequate time is available post LOCA or post SSF event to isolate the SFP before the TS limit is reached. For a LOCA, a non QA-1 switch installed in an alternate accessible location will be used to shutdown the RO unit when aligned to the Unit 1 & 2 SFP or the Unit 1 & 2 SFP supply valve may be used if accessible. For a LOCA, if aligned to Unit 3 SFP, the RO unit may be shutdown using this switch or by closing a supply valve in the Unit 3 SFP area since it will remain accessible during a LOCA on Unit 2. For an SSF event, the RO unit may be shutdown locally (at its location in Room 349), or by using the non QA-1 switch, or by closing a supply valve in the Unit 1 & 2 or Unit 3 SFP area.

3.4 Evaluation of Impact to the BWST

There is one BWST for each unit. The BWST provides a source of borated water to the HPI, LPI, and RBS pumps. As such, it provides reactor building cooling and depressurization, core cooling, and replacement inventory and is a source of negative reactivity for reactor shutdown.

The BWSTs are designed to withstand seismic loading. Therefore the water inventory contained in the BWSTs is protected from loss due to seismic loadings. The RO unit and the majority of RO System piping are not designed to withstand seismic loading. The effect of RO System piping ruptures on the BWST while the RO System is processing BWST water is addressed in this section. Water from ruptures will be contained in the Auxiliary Building. An evaluation for Auxiliary Building flood is provided in Section 3.5.

Some existing BWST connections are currently not designed to withstand tornado missile loads. Some piping from the Unit 1 BWST, the Unit 2 BWST, and the Unit 3 BWST to the RO System is routed in areas of the Auxiliary Building that are also not protected from tornado missile loads. To not increase the vulnerability of the BWST contents to tornado missile loads, administrative controls will be in place to shutdown and isolate the RO System from the BWSTs when ONS is placed under a tornado watch or warning.

A High Energy Line Break (HELB) in the RO unit or a postulated break in non seismic portions of the RO System would result in Auxiliary Building flooding and impact to the BWST inventory The effects of Auxiliary Building flooding are addressed in Section 3.5.

Ruptures in the RO System piping (non-seismic and high energy portions) would result in a loss of inventory from the BWST since the RO System takes suction from the SF purification loop which is at an elevation lower than the bottom of the BWST. Operator action is relied upon to isolate the BWST from the RO System following a rupture of the RO System piping. Procedural controls will be established to isolate the BWST from the RO System to minimize BWST inventory loss. The BWST level may drop below the TS required level due to a rupture of high energy or non seismic piping. For the HELB event, the BWST is not required for mitigation. For the seismic event, the BWST is not needed for accident mitigation since Oconee's licensing basis does not assume a design basis event occurs simultaneously with a seismic event.

The operation of the RO System with its alignment to the BWST creates new concerns for deboration of the BWST as well as loss of inventory from the BWST. The return flow from the RO System to the BWST will be of lower boron concentration. The normal reject flow from the RO System will result in reduced BWST volume.

Duke Energy will use procedural controls to ensure correct suction/discharge alignment and to ensure BWST temperature, volume, and boron concentration are maintained within TS 3.5.4 limits during operation of the RO System during normal Unit operation. The RO unit will add some heat to the water being purified due to pump operation. Due to this heat addition, RO System operating procedures will require BWST temperature monitoring to ensure the BWST water stays within the TS required temperature range. The boron concentration in the BWST will be increased, as necessary, prior to RO System operation to compensate for boron dilution caused by RO System operation. The BWST volume will be increased to compensate for the water rejected during RO System operation (the reject flow is a manual setting on the RO unit). Time restrictions will be placed on RO System operation to limit the amount of time the system can be operated before boron concentration or level adjustment is required. These controls ensure adequate borated water inventory is available to mitigate the design basis transients at any time during RO System operation as described below.

Duke Energy evaluated whether an RO unit lined up to the BWST would need to be shut off post LOCA to avoid reducing BWST boron concentration and volume below TS limits. Insufficient water inventory in the BWST could result in insufficient cooling capacity by the ECCS when the transfer to the recirculation mode occurs. Reduced boron concentrations could result in a reduction of Shutdown Margin. For the LBLOCA, the BWST volume will be used before the RO unit can significantly reduce boron concentration or volume. For the SBLOCA, continued RO unit operation will eventually degrade BWST contents and must be terminated. The RO unit can be shut off at the RO unit location in Room 349 or at an alternate location. The RO unit is non-QA-1 therefore the controls and shutoff valve are also non-QA-1. Radiation levels post LOCA will permit access to the RO unit until switchover to reactor building emergency sump recirculation. After switchover, the ability to isolate the BWST or shut down the RO unit is diminished due to the onset of higher radiation levels in the Auxiliary Building at the location of an isolation valve in the supply line or at the RO unit.

For the design basis LBLOCA, the BWST will be expended in a short time period; not long enough for RO System operation to significantly reduce BWST boron concentration or volume (i.e., TS limits for boron and temperature maintained). Therefore, there is no need to isolate the RO unit post LBLOCA (BWST has already performed its safety function) when the RO unit is aligned to the BWST for the ONS unit with the LBLOCA. However, should the RO unit be aligned to the Unit 1 BWST or Unit 3 BWST and a LBLOCA occurs on Unit 2, the RO unit will eventually need to be shut down to avoid going below the TS limits for volume or boron concentration for the unaffected Oconee Unit. No access will be available to shutdown the RO unit or close the supply valve to isolate the Unit 1 BWST due to higher radiation levels at the RO unit location (Room 349). The modification installs a non QA-1 switch in an alternate accessible location to allow remote shutdown of the RO unit prior to degrading the Unit 1 BWST. If aligned to the Unit 3 BWST, the RO unit may be shutdown using this switch or by closing a supply valve in the Unit 3 SFP area since it will remain accessible.

For the SBLOCA, adequate time is available for an operator to shut off the RO unit prior to switchover to the reactor building recirculation phase which would cause accessibility problems. The RO unit can be de-energized at its non QA-1 control panel or a non QA-1 supply valve to the RO unit can be closed (note that the RO unit will experience a protective trip if the supply valve is closed). The RO unit can also be shutoff using the non QA-1 switch installed at the alternate remote location described above. If the BWST is depleted prior to RO System shut off, not enough time has elapsed for the RO unit to reduce the boron concentration or volume below the minimum values that are required to be present at the start of the LOCA.

ONS procedures will require an operator to be dispatched to the RO unit within an evaluated maximum delay after receipt of an ECCS Injection signal to isolate the RO System from the BWST at the RO unit location in Room 349 unless switchover to the reactor building recirculation phase has already occurred. The RO unit can also be shutdown using the non QA-1 switch installed in an alternate accessible location.

3.5 Evaluation of Impacts due to Auxiliary Building Flooding

A rupture in the RO System creates a new flooding source to the Auxiliary Building. An evaluation of the effects of a failure of the RO System piping was performed to demonstrate that adequate measures can be taken to mitigate an Auxiliary Building flood prior to affecting SSCs important to safety.

In ONS's licensing basis, seismic is considered a design criterion. One exception to it being just design criteria relates to questions asked by the NRC regarding non-seismic pipe breaks in the Auxiliary Building. As such, currently the Auxiliary Building could be subject to flooding from a single break in any one of three non-seismic sources; the high pressure service water system (source for fire protection), the non-seismic portions of the low pressure service water system (the ventilation cooling water), and the plant drinking water system. This is an approved change (Reference 5) to UFSAR Section 3.4.1.1.1 that will be included in the next annual UFSAR update. Non seismic RO System piping will be another Auxiliary Building flood source. Certain portions of High Pressure Service Water (HPSW) are not considered flood sources based on the results of realistic seismic analyses that demonstrate the pipes and supports will not fail during a seismic event. The remaining portions of the non-seismic HPSW system, the non-seismic portions of the Low Pressure Service Water (LPSW) system and the plant drinking water system are isolated or flow limited to allow operators sufficient time to identify and isolate the source. Flooding by these sources will be detected through procedural response to a seismic event or high level alarm sensors (non-seismic) in the auxiliary building sumps.

A similar analysis used for the non-seismic sources already included in ONS's licensing basis has been performed for the RO System to confirm operators can isolate any failed portion of the piping prior to adversely affecting SSCs important to safety (LPI and HPI pumps). Based on the break flow, sufficient time is available to isolate non-seismic portions of the RO System to protect affected SSCs important to safety. The Class D piping in the RO System is designed to retain pressure boundary integrity following a seismic event, thus it is assumed to not rupture and cause an Auxiliary Building flood.

3.6 Evaluation of Potential Release of Radioactivity

All of the new piping installed for the RO System is located inside the Auxiliary Building. Some of the piping from the Unit 1 & 2, and Unit 3 SFP is routed in areas of the Auxiliary Building that are not protected from the effects of tornado loading. Administrative controls will be in place to shutdown and isolate the RO System from the affected SFP or BWST when ONS is placed under a tornado watch or warning to protect against the effects of a pipe break that could cause the release of radioactivity. Some of the new piping is not designed to withstand seismic loading. Any ruptures in piping below ground elevation (796'-6") inside the Auxiliary Building will be contained within the Auxiliary Building. However, piping above ground elevation was evaluated to determine if new release pathways to outside were created. The pipe routing for the new piping was reviewed for any potential water release pathways to the outside.

The new potential water release pathways to the outside include the following:

- Unit 1 & 2 SFP Fuel Loading Truck Bay
- Hot Machine Shop
- Unit 3 Ventilation Equipment Room
- Unit 3 West Penetration Room (WPR)
- Unit 3 Cask Decon Room
- Unit 2 Room 349

A portion of the RO System suction piping from the Unit 1 & 2 SFP is routed through the Unit 1 & 2 Fuel Loading Truck Bay. The Unit 1 & 2 Fuel Loading Truck Bay has three floor drains that direct water to the Unit 1 & 2 LPI Room 62 Sump. The capacity of two of the floor drains is adequate to capture water from postulated pipe ruptures in the fuel loading truck bay. Therefore, a pipe rupture would not create a potential for the release of radioactivity outside the Auxiliary Building.

A portion of the RO System suction piping from the Unit 1 & 2 SFP is routed through the Hot Machine Shop. The Hot Machine Shop has no floor drains but does have a stairway for drainage that would contain some water in the Auxiliary Building. The room has exits to the outside. A postulated pipe rupture in this room could have caused a release of radioactive water through these exit points. To preclude this, the RO System modification installs Class D piping through this room.

A portion of the RO System suction piping from the Unit 3 SFP is routed through the Unit 3 Ventilation Equipment Room. The Unit 3 Ventilation Equipment Room has no floor drains. The room has exit points to the outside. A postulated pipe rupture in this room could result in a release of radioactive water through these exit points. The RO System piping routed through the Unit 3 Ventilation Equipment Room that is below the SFP water level has been designed for seismic loading (Class D). Therefore, there are no postulated pipe ruptures in this room.

A portion of the RO System suction piping from the Unit 3 SFP is routed through the Unit 3 WPR. The Unit 3 WPR has one floor drain that directs water to the Unit 3 LPI Room 82 Sump. However, this floor drain is normally isolated by a closed valve. This room has exit points to the outside. A postulated pipe rupture in this room could result in a release of radioactive water through these exit points. The RO System piping routed through the Unit 3 WPR has been designed for seismic loading (Class D). Therefore, there are no postulated pipe ruptures in this room.

A portion of the RO System suction piping from the Unit 3 SFP is routed through the Unit 3 Cask Decon Room. The piping in this room only comes from the U3 SFP. SFP water from a postulated rupture in this room would be diverted to other parts of the Auxiliary Building by a pipe trench in the room and is totally contained within the Auxiliary Building.

The RO System, along with its common suction and discharge piping is located inside Unit 2 Room 349. There are three floor drains serving this area that direct water to the Unit 1 & 2 LPI Room 62 Sump and a large pipe trench that directs water to the SF Cooler Room. This room also has an exit point to the outside but has a curb at the exit point that will contain water until it can be directed to the sump. Any excess water from a postulated pipe break in this room would be diverted to other parts of the Auxiliary Building and totally is contained within the Auxiliary Building.

3.7 Summary

For some cases, RO System operation must be stopped should a LBLOCA or SBLOCA occur to preclude violating TS limits for BWST and SFP boron concentration and BWST inventory. RO System design features, operating restrictions, and operator actions are adequate to mitigate the effects of RO System operation concurrent with these events. Non seismic RO System piping is an auxiliary building flood source. The postulated failure of non seismic RO System piping, as well as the high energy portions, can be isolated using operator actions prior to significantly affecting SSCs important to safety. In addition, administrative controls will be taken to preclude the release of radioactive water outside the Auxiliary Building during RO System operation.

4.0 REGULATORY EVALUATION

4.1 Significant Hazards Consideration

Duke Energy Carolinas, LLC (Duke Energy), has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in Title 10, Code of Federal Regulations, Part 50, Section 92 (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 proposed change requests Nuclear Regulatory Commission (NRC) approval of design features and controls that will be used to ensure that periodic limited operation of a Reverse Osmosis (RO) System during Unit operation does not significantly impact the Borated Water Storage Tank (BWST) or Spent Fuel Pool (SFP) function or other plant equipment. Duke Energy evaluated the effect of potential failures, identified precautionary measures that must be taken before and during RO System operation, and required operator actions to protect affected structures, systems, and components (SSCs) important to safety.

The new high energy piping and non seismic piping being installed for the RO System is non QA-1 and is postulated to fail and cause an Auxiliary Building flood. Duke Energy determined that adequate time is available to isolate the flood source (BWST or SFP) prior to affecting SSCs important to safety.

The existing Auxiliary Building Flood evaluation postulates a single break in the non-seismic piping occurring in a seismic event. The addition of the RO System will not increase the frequency of a seismic event. This event does not consider the amount of non-seismic piping that is currently in the Auxiliary Building. The new piping is not more likely to fail as compared to the existing non-seismic piping. The existing postulated source of the pipe break in the Auxiliary Building is due to the piping not being seismically designed. The new RO System piping is considered a potential source of a single pipe break for the same reason. Since the accident itself is defined as the failure of non-seismic pipe, the new non-seismic piping does not increase the frequency of occurrence of an Auxiliary Building flood. The mitigation of an Auxiliary Building flood due to non seismic piping failure is by manual operator action. The same mitigation technique is used for the high energy line break.

The RO System takes suction from the top of the SFP to protect SFP inventory. Plant procedures will prohibit the use of the RO System during the time period directly after an outage that requires the Unit 1 & 2 SFP level to be maintained higher than the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.11 level requirement. The higher level is required to support TS LCO 3.10.1 requirements for Standby Shutdown Facility (SSF) Reactor Coolant (RC) Makeup System operability (due to the additional decay heat from the recently offloaded spent fuel). Plant procedures will also specify the siphon be broken during this time period so the SFP water above the RO suction point cannot be siphoned off if the RO piping breaks. The proposed change does not impact the fuel assemblies, the movement of fuel, or the movement of fuel shipping casks. The SFP boron concentration, level, and temperature limits will not be outside of required parameters due to restrictions/requirements on the system's operation.

The BWST is used for mitigation of Steam Generator Tube Rupture (SGTR), Main Steam Line Break (MSLB) and Loss of Coolant Accidents (LOCAs). The SGTR and MSLB are bounded by the SBLOCA analyses with respect to the performance requirements for the HPI System. In the normal mode of Unit operation, the BWST is not an accident initiator. The SFP is assumed to maintain acceptable criticality margin for all abnormal and accident conditions including Fuel Handling Accidents (FHAs) and cask drop accidents. Both the BWST and SFP are specified by TS requirements to have minimum levels/volumes and boron concentrations. The BWST also has TS requirements for temperature. Prior to RO operation, procedures will require that minimum required initial boron concentration, and initial level/volume be adjusted and that the RO System be operated for a specified maximum time period before readjusting volume and boron concentration prior to another RO session to ensure that the TS specified boron concentration and level/volume limits for both the SFP and the BWST are not exceeded during RO System operation. Thus, the design functions of the BWST and the SFP will continue to be met during RO System operation.

An Auxiliary Building flood due to a non-seismic RO System pipe break does not increase the consequences of the flood since the new non-seismic pipe break is bounded by the Auxiliary Building flood caused by existing non-seismic pipe breaks. Although the RO System will return water with lower boron concentration, procedural controls will ensure that the TS boron concentration level does not go below the limit. Thus, no adverse effects from decreased boron concentration levels will occur.

Since the BWST and SFP will still have TS required boron concentration and level/volume, the mitigation of a LOCA or FHA does not result in an increase in dose consequence.

Therefore, installation and operation of the RO System during Unit operation does not significantly increase the probability or consequences of any accident previously evaluated.

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

No. The RO System adds non-seismic piping in the Auxiliary Building. However, the break of a single non-seismic pipe in the Auxiliary Building has already been postulated as an event in the licensing basis. The RO System also does not create the possibility of a seismic event concurrent with a LOCA since a seismic event is a natural phenomena event. The RO System does not adversely affect the Reactor Coolant System pressure boundary. The suction to the RO System, when using the system for BWST purification, contains a normally closed manual seismic boundary valve so the seismic design criteria is met for separation of seismic/non-seismic piping boundaries.

Duke Energy also evaluated potential releases of radioactive liquid to the environment due to RO System piping failures. Design features and administrative controls preclude release of radioactive materials outside the Auxiliary Building. Releases inside the Auxiliary Building are bounded by existing analyses.

The SFP suction line is designed such that the SFP water level will not go below TS required levels, thus the fuel assemblies will have the TS required water level over them. Procedural controls will restrict the use of the RO System and require breaking vacuum on the SFP suction line when the SSF conditions require the SFP level be raised to support SSF RC Makeup System operability. Thus, the SFP water level will not be reduced below required water levels for these conditions. RO System operating restrictions will prevent reducing the SFP boron concentration below TS limits.

Therefore, operation of the RO System during Unit operation 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 RO System adds non-seismic piping in the Auxiliary Building. Duke Energy evaluated the impact of RO System operation on SSCs important to safety and determined that procedural controls will ensure that TS limits for SFP and BWST volume, temperature and boron concentration will continue to be met during RO operation. For the BWST, these controls will ensure the TS minimum BWST boron concentration and level are available to mitigate the consequences of a small break LOCA or a large break LOCA. For the SFP, these controls ensure the assumptions of the fuel handling and cask drop accident analyses are preserved. Additionally, the failure of non seismic RO System piping will not significantly impact SSCs important to safety. The BWST level may drop below the TS required level due to a rupture of the non seismic piping during a seismic event. However, due to the low probability of a seismic event coupled with the relatively short period of time the RO System will be aligned to the BWST, the possibility of dropping below the TS required level does not involve a significant reduction in the margin of safety. In addition, Oconee's licensing basis does not assume a design basis event occurs simultaneously with a seismic event. The proposed change does not significantly impact the condition or performance of SSCs relied upon for accident mitigation. This change does not alter the existing TS allowable values or analytical limits. The existing operating margin between Unit conditions and actual Unit setpoints is not significantly reduced due to these changes. The assumptions and results in any safety analyses are not impacted. Therefore, operation of the RO System during Unit operation does not involve a significant reduction in a margin of safety.

Duke Energy has concluded based on the above, that there are no significant hazards considerations involved in this amendment request.

4.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical specifications"
10 CFR 50.59, "Changes, test, experiments"

4.3 Precedent

May 12, 2000	Diablo Canyon - License Amendment Request to request approval of a Refueling Water Purification System Upgrade and Temporary Reverse Osmosis Skid Installation To Support RWST Cleanup During Power Operation
January 21, 2001	Issuance of Amendment Nos. 144 & 143 to Diablo Canyon Nuclear Power Plant, Units No. 1 and 2

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 adverse 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 Energy Carolinas, LLC 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 License Amendment Request (LAR) 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 proposed LAR 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 LAR will not impact occupational radiation exposure. Therefore, there will be no significant increase in individual or cumulative occupational radiation exposure.

6.0 REFERENCES

1. NRC letter to Duke Power Company dated December 24, 1980, Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Amendment Nos. 90, 90, and 87, for Oconee Nuclear Station Units 1, 2, and 3, respectively

2. Duke Energy Corporation letter to NRC dated December 28, 2000, Proposed Technical Specification Amendment Generic Letter 96-04 – Spent Fuel Storage Racks (TSCR 2000-01)

3. NRC letter to Duke Energy Corporation dated April 22, 2002, Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Amendment Nos. 323, 323, and 324, for Oconee Nuclear Station Units 1, 2, and 3, respectively

4. Duke Energy Carolinas, LLC letter to NRC, License Amendment Request to Change Technical Specification Surveillance Requirement Frequencies to Support 24-Month Fuel Cycles (LAR 2010-001)

5. NRC letter to Duke Power Company, LLC dated November 14, 2007, Oconee Nuclear Station, Units 1, 2, and 3, Issuance Of Amendments Regarding The Flood Protection Measures For The Auxiliary Building

6. NUREG 1430, Rev. 3, Standard Technical Specifications Babcock and Wilcox Plants (TS 3.5.4, 3.7.14, & 3.7.15), June 2004