Duke Energy®

BRUCE H HAMILTON
Vice President
Oconee Nuclear Station

Duke Energy Corporation
ON01VP / 7800 Rochester Highway
Seneca, SC 29672

864 885 3487
864 885 4208 fax
bhhamilton@duke-energy.com

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U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Subject: Duke Power Company LLC
d/b/a Duke Energy Carolinas, LLC
Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Technical Specification Bases (TSB) Change

On June 19, 2007 Station Management approved revisions to TSB 3.6.5 to revise the applicable safety analysis of the Reactor Building Spray and Cooling Systems to reflect revised pressure and temperature results of the replacement steam generator peak containment pressure analysis.

Attachment 1 contains the new TSB pages, Attachment 2 contains the marked up version of the TSB pages.

If any additional information is needed, please contact Reene Gambrell at 864-885-3364.

Very truly yours,

Bruce Hamilton

B. H. Hamilton, Vice President
Oconee Nuclear Site

A001

NRR

cc: Mr. L. N. Olshan
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. W. D. Travers, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Dan Rich
Senior Resident Inspector
Oconee Nuclear Station

Mr. Henry Porter Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

bcc: w/o attachments
L. F. Vaughn
Ken Ashe - MNS
R. D. Hart - CNS
R. L. Gill - NRI&IA

w/attachments
Document Management
ELL
NSRB
MR Coordinator (Ron Harris)
Licensing Working Group

Attachment #1

Proposed Bases revision

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B 3.6 CONTAINMENT SYSTEMS

B 3.6.5 Reactor Building Spray and Cooling Systems

BASES

BACKGROUND

The Reactor Building Spray and Reactor Building Cooling systems provide containment atmosphere cooling to limit post accident pressure and temperature in containment to less than the design values. Reduction of containment pressure and the iodine removal capability of the spray reduces the release of fission product radioactivity from containment to the environment, in the event of an accident, to within limits. The Reactor Building Spray and Reactor Building Cooling systems are designed to meet ONS Design Criteria (Ref. 1).

The Reactor Building Cooling System and Reactor Building Spray System are Engineered Safeguards (ES) systems. They are designed to ensure that the heat removal capability required during the post accident period can be attained. The Reactor Building Spray System and Reactor Building Cooling System provide containment heat removal operation. The Reactor Building Spray System and Reactor Building Cooling System provide methods to limit and maintain post accident conditions to less than the containment design values.

Reactor Building Spray System

The Reactor Building Spray System consists of two separate trains of equal capacity, each capable of meeting the design basis. Each train includes a reactor building spray pump, spray headers, nozzles, valves, piping and a flow indicator. Each train is powered from a separate ES bus. The borated water storage tank (BWST) supplies borated water to the Reactor Building Spray System during the injection phase of operation. In the recirculation mode of operation, Reactor Building Spray System pump suction is manually transferred to the reactor building sump.

BASES

BACKGROUND

Reactor Building Spray System (continued)

The Reactor Building Spray System provides a spray of relatively cold borated water into the upper regions of containment to reduce the containment pressure and temperature and to reduce the concentration of fission products in the containment atmosphere during an accident. In the recirculation mode of operation, heat is removed from the reactor building sump water by the decay heat removal coolers. Each train of the Reactor Building Spray System provides adequate spray coverage to meet the system design requirements for containment heat removal.

The Reactor Building Spray System is actuated automatically by a containment High-High pressure signal. An automatic actuation opens the Reactor Building Spray System pump discharge valves and starts the two Reactor Building Spray System pumps.

Reactor Building Cooling System

The Reactor Building Cooling System consists of three reactor building cooling trains. Each cooling train is equipped with cooling coils, and an axial vane flow fan driven by a two speed electric motor.

During normal unit operation, typically two reactor building cooling trains with two fans operating at low speed or high speed, serve to cool the containment atmosphere. Low speed cooling fan operation is available during periods of lower containment heat load. The third unit is usually on standby. Upon receipt of an emergency signal, the operating cooling fans running at low speed or high speed will automatically trip, then restart in low speed after a 3 minute delay, and any idle unit is energized in low speed after a 3 minute delay. The fans are operated at the lower speed during accident conditions to prevent motor overload from the higher density atmosphere.

APPLICABLE SAFETY ANALYSES

The Reactor Building Spray System and Reactor Building Cooling System reduce the temperature and pressure following an accident. The limiting accidents considered are the loss of coolant accident (LOCA) and the steam line break. The postulated accidents are analyzed, with regard to containment ES systems, assuming the loss of one ES bus. This is the worst-case single active failure, resulting in one train of the Reactor Building Spray System and one train of the Reactor Building Cooling System being inoperable.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The analysis and evaluation show that, under the worst-case scenario (LOCA with worst-case single active failure), the highest peak containment pressure is 57.75 psig. The analysis shows that the peak containment temperature is 283.1°F. Both results are less than the design values. The analyses and evaluations assume a power level of 2619 MWt, one reactor building spray train and two reactor building cooling trains operating, and initial (pre-accident) conditions of 80°F and 15.9 psia. The analyses also assume a delayed initiation to provide conservative peak calculated containment pressure and temperature responses.

The Reactor Building Spray System total delay time of approximately 100 seconds includes Keowee Hydro Unit startup (for loss of offsite power), reactor building spray pump startup, and spray line filling (Ref. 2).

Reactor building cooling train performance for post accident conditions is given in Reference 2. The result of the analysis is that any combination of two trains can provide 100% of the required cooling capacity during the post accident condition. The train post accident cooling capacity under varying containment ambient conditions is also shown in Reference 2.

Reactor Building Cooling System total delay time of 3 minutes includes KHU startup (for loss of offsite power) and allows all ES equipment to start before the Reactor Building Cooling Unit on the associated train is started. This improves voltages at the 600V and 208V levels for starting loads (Ref. 2).

The Reactor Building Spray System and the Reactor Building Cooling System satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

During an accident, a minimum of two reactor building cooling trains and one reactor building spray train are required to maintain the containment pressure and temperature following a LOCA. Additionally, one reactor building spray train is required to remove iodine from the containment atmosphere and maintain concentrations below those assumed in the safety analysis. To ensure that these requirements are met, two reactor building spray trains and three reactor building cooling trains must be OPERABLE in MODES 1 and 2. In MODES 3 or 4, one reactor building spray train and two reactor building cooling trains are required to be OPERABLE. The LCO is provided with a note that clarifies this requirement. Therefore, in the event of an accident, the minimum requirements are met, assuming the worst-case single active failure occurs.

BASES

LCO (continued)

Each reactor building spray train shall include a spray pump, spray headers, nozzles, valves, piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the BWST (via the LPI System) upon an Engineered Safeguards Protective System signal and manually transferring suction to the reactor building sump. The OPERABILITY of RBS train flow instrumentation is not required for OPERABILITY of the corresponding RBS train because system resistance hydraulically maintains adequate NPSH to the RBS pumps and manual throttling of RBS flow is not required. During an event, LPI train flow must be monitored and controlled to support the RBS train pumps to ensure that the NPSH requirements for the RBS pumps are not exceeded. If the flow instrumentation or the capability to control the flow in a LPI train is unavailable then the associated RBS train's OPERABILITY is affected until such time as the LPI train is restored or the associated LPI pump is placed in a secured state to prevent actuation during an event.

Each reactor building cooling train shall include cooling coils, fusible dropout plates or duct openings, an axial vane flow fan, instruments, valves, and controls to ensure an OPERABLE flow path. Valve LPSW-108 shall be locked open to support system OPERABILITY.

APPLICABILITY

In MODES 1, 2, 3, and 4, an accident could cause a release of radioactive material to containment and an increase in containment pressure and temperature, requiring the operation of the reactor building spray trains and reactor building cooling trains.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the Reactor Building Spray System and the Reactor Building Cooling System are not required to be OPERABLE in MODES 5 and 6.

ACTIONS

The Actions are modified by a Note indicating that the provisions of LCO 3.0.4 do not apply for Unit 2 only. As a result, this allows entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate.

BASES

ACTIONS (continued)

The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10 CFR 50.65(a)(4), which requires that risk impacts of maintenance activities to be assessed and managed. The risk assessment must take into account all inoperable Technical Specifications equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." Regulatory Guide 1.1 82 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed MODE change is acceptable. Consideration should also be given to the probability of completing restoration such that the requirements of the LCO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability. The risk assessment does not have to be documented.

There is a small subset of systems and components that have been determined (Ref: B&W owners group generic qualitative risk assessments- attachment to TSTF-359, Rev. 9, "B&W owners group Qualitative Risk Assessment for Increased Flexibility in MODE Restraints," Framatome Technologies BAW-2383, October 2001.) to be of higher risk significance for which an LCO 3.0.4 exemption would not be allowed. For Oconee these are the Decay Heat Removal System (DHR) entering MODES, 5 and 4; Keowee Hydro Units entering MODES 1-5; and the emergency feedwater system (EFW) entering MODE 1. The Reactor Spray and Cooling System is not one of the higher risk significant systems noted.

The provisions of this Note should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified Condition in the Applicability.

BASES

ACTIONS (continued)

A.1

With one reactor building spray train inoperable in MODE 1 or 2, the inoperable reactor building spray train must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE spray and cooling trains are adequate to perform the iodine removal and containment cooling functions. The 7 day Completion Time takes into account the redundant heat removal capability afforded by the OPERABLE reactor building spray train, reasonable time for repairs, and the low probability of an accident occurring during this period.

The 14 day portion of the Completion Time for Required Action A.1 is based upon engineering judgment. It takes into account the low probability of coincident entry into two Conditions in this LCO coupled with the low probability of an accident occurring during this time. Refer to Section 1.3, Completion Times, for a more detailed discussion of the purpose of the "from discovery of failure to meet the LCO" portion of the Completion Time.

B.1

With one of the reactor building cooling trains inoperable in MODE 1 or 2, the inoperable reactor building cooling train must be restored to OPERABLE status within 7 days. The components in this degraded condition provide iodine removal capabilities and are capable of providing at least 100% of the heat removal needs after an accident. The 7 day Completion Time was developed taking into account the redundant heat removal capabilities afforded by combinations of the Reactor Building Spray System and Reactor Building Cooling System and the low probability of an accident occurring during this period.

The 14 day portion of the Completion Time for Required Action B.1 is based upon engineering judgment. It takes into account the low probability of coincident entry into two Conditions in this LCO coupled with the low probability of an accident occurring during this time. Refer to Section 1.3 for a more detailed discussion of the purpose of the "from discovery of failure to meet the LCO" portion of the Completion Time.

C.1

With one reactor building spray train and one reactor building cooling train inoperable in MODE 1 or 2, at least one of the inoperable trains must be restored to OPERABLE status within 24 hours. In this Condition, the remaining OPERABLE spray and cooling trains are adequate to provide iodine removal capabilities and are capable of providing at least 100% of the heat removal needs after an accident. The 24 hour Completion Time

ACTIONS

C.1 (continued)

takes into account the heat removal capability afforded by the remaining OPERABLE spray train and cooling trains, reasonable time for repairs, and the low probability of an accident occurring during this period.

D.1

If the Required Action and associated Completion Time of Condition A, B or C are not met, the unit must be brought to a MODE in which the LCO, as modified by the Note, does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

E.1

With one of the required reactor building cooling trains inoperable in MODE 3 or 4, the required reactor building cooling train must be restored to OPERABLE status within 24 hours.

The 24 hour Completion Time is reasonable based on engineering judgement taking into account the iodine and heat removal capabilities of the remaining required train of reactor building spray and cooling.

F.1

With one required reactor building spray train inoperable in MODE 3 or 4, the required reactor building spray train must be restored to OPERABLE status within 24 hours. The 24 hour Completion Time is reasonable based on engineering judgement taking into account the heat removal capabilities of the remaining required trains of reactor building cooling.

G.1

If the Required Actions and associated Completion Times of Condition E or F of this LCO are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit

BASES

ACTIONS

G.1 (continued)

conditions from full power conditions in an orderly manner and without challenging unit systems.

H.1

With two reactor building spray trains, two reactor building cooling trains or any combination of three or more reactor building spray and reactor building cooling trains inoperable in MODE 1 or 2, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

With any combination of two or more required reactor building spray and reactor building cooling trains inoperable in MODE 3 or 4, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying the correct alignment for manual and non-automatic power operated valves in the reactor building spray flow path provides assurance that the proper flow paths will exist for Reactor Building Spray System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position.

SR 3.6.5.2

Operating each required reactor building cooling train fan unit for $\geq$ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency was developed considering the known reliability of the fan units and controls, the three train redundancy available, and the low

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.2 (continued)

probability of a significant degradation of the reactor building cooling trains occurring between surveillances and has been shown to be acceptable through operating experience.

SR 3.6.5.3

Verifying that each required Reactor Building Spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the Reactor Building Spray System pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and may detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.5.4

Verifying the containment heat removal capability provides assurance that the containment heat removal systems are capable of maintaining containment temperature below design limits following an accident. This test verifies the heat removal capability of the Low Pressure Injection (LPI) Coolers and Reactor Building Cooling Units. The 18 month Frequency was developed considering the known reliability of the low pressure service water, reactor building spray and reactor building cooling systems and other testing performed at shorter intervals that is intended to identify the possible loss of heat removal capability.

SR 3.6.5.5 and SR 3.6.5.6

These SRs require verification that each automatic reactor building spray valve actuates to its correct position and that each reactor building spray pump starts upon receipt of an actual or simulated actuation signal. The test will be considered satisfactory if visual observation and control board indication verifies that all components have responded to the actuation signal properly; the appropriate pump breakers have closed, and all valves have completed their travel. This SR is not required for valves that are

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.5 and SR 3.6.5.6 (continued)

locked, sealed, or otherwise secured in position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.5.7

This SR requires verification that each required reactor building cooling train actuates upon receipt of an actual or simulated actuation signal. The test will be considered satisfactory if control board indication verifies that all components have responded to the actuation signal properly, the appropriate valves have completed their travel, and fans are running at half speed. The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. See SR 3.6.5.5 and SR 3.6.5.6, above, for further discussion of the basis for the 18 month Frequency.

SR 3.6.5.8

With the reactor building spray header isolated and drained of any solution, station compressed air is introduced into the spray headers to verify the availability of the headers and spray nozzles. Performance of this Surveillance demonstrates that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive nature of the design of the nozzles, a test at 10 year intervals is considered adequate to detect obstruction of the spray nozzles.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Section 6.2.
3. 10 CFR 50.36.
4. ASME, Boiler and Pressure Vessel Code, Section XI.

Attachment #2

Markup of current Bases

BASES

APPLICABLE SAFETY ANALYSES (continued)

The analysis and evaluation show that, under the worst-case scenario (LOCA with worst-case single active failure), the highest peak containment pressure is ~~58.9~~*57.75* psig. The analysis shows that the peak containment temperature is ~~285~~*283.1*°F. Both results are less than the design values. The analyses and evaluations assume a power level of 2619 MWt, one reactor building spray train and two reactor building cooling trains operating, and initial (pre-accident) conditions of ~~110~~*80*°F and ~~16.2~~ *15.9* psia. The analyses also assume a delayed initiation to provide conservative peak calculated containment pressure and temperature responses.

The Reactor Building Spray System total delay time of 92 seconds for Unit 1 and approximately 100 seconds for Units 2 and 3 includes Keowee Hydro Unit startup (for loss of offsite power), reactor building spray pump startup, and spray line filling (Ref. 2).

Reactor building cooling train performance for post accident conditions is given in Reference 2. The result of the analysis is that any combination of two trains can provide 100% of the required cooling capacity during the post accident condition. The train post accident cooling capacity under varying containment ambient conditions is also shown in Reference 2.

For Units 1 and 2, the Reactor Building Cooling System total delay time of 78 seconds includes signal delay, KHU startup (for loss of offsite power), low pressure service water pump startup and low pressure service water valve stroke times. For Unit 3, a Reactor Building Cooling System total delay time of 3 minutes includes KHU startup (for loss of offsite power) and allows all ES equipment to start before the Reactor Building Cooling Unit on the associated train is started. This improves voltages at the 600V and 208V levels for starting loads (Ref. 2).

The Reactor Building Spray System and the Reactor Building Cooling System satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

During an accident, a minimum of two reactor building cooling trains and one reactor building spray train are required to maintain the containment pressure and temperature following a LOCA. Additionally, one reactor building spray train is required to remove iodine from the containment atmosphere and maintain concentrations below those assumed in the safety analysis. To ensure that these requirements are met, two reactor building spray trains and three reactor building cooling trains must be OPERABLE in MODES 1 and 2. In MODES 3 or 4, one reactor building spray train and two reactor building cooling trains are required to be OPERABLE. The LCO is provided with a note that clarifies this requirement. Therefore, in the event of an accident, the minimum requirements are met, assuming the worst-case single active failure occurs.