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

October 30, 2007

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 October 18, 2007 Station Management approved revisions to TSB 3.7.11 and 3.7.15 to revise the bases to reflect ONS approval to implement the Alternate Source Term (AST) Methodology for fuel handling accidents described in UFSAR 15.11.

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,

For 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

Remove Page	Insert Page
B 3.7.11-1	B 3.7.11-1
B 3.7.11-2	B 3.7.11-2
B 3.7.11-3	B 3.7.11-3
B 3.7.15-1	B 3.7.15-1
B 3.7.15-2	B 3.7.15-2
B 3.7.15-3	B 3.7.15-3

B 3.7 PLANT SYSTEMS

B 3.7.11 Spent Fuel Pool Water Level

BASES

BACKGROUND

The minimum water level in the Spent Fuel Pool 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.

A general description of the Spent Fuel Pool design is given in the UFSAR, Section 9.1.2, Reference 1. The Spent Fuel Pool Cooling and Cleanup System is given in the UFSAR, Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident or cask drop are given in the UFSAR, Section 15.11.2 (Ref. 3).

APPLICABLE SAFETY ANALYSES

During movement of irradiated fuel assemblies or crane operations with loads in the Spent Fuel Pool, the water level in the pool is an initial condition design parameter in the analysis of the fuel handling accident and cask drop accidents in the fuel pool. A minimum water level of 23 ft (Ref. 4) allows a decontamination factor (DF) of 200 (Ref. 4) to be used in the accident analysis for iodine.

The fuel handling accident and cask drop accident analysis in the Spent Fuel Pool is described in Reference 3. Since the minimum water level of 21.34 feet is less than 23 feet, the assumed iodine DF must be less than 200, according to Reference 4, and calculated with comparable conservatism. Oconee's analysis assumes the top of the irradiated fuel assemblies as the top of the fuel pins (Ref. 4). An experimental test program described in WCAP-7828 (Ref. 5) evaluated the extent of removal of iodine released from a damaged irradiated fuel assembly. Using the analytical results from the test program described in WCAP-7828, with a water depth of 21.34 feet, a comparable DF of 183 was determined. With a minimum water level of 21.34 ft, and a minimum decay time of 72 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated fuel handling or cask drop accident is adequately captured by the water and offsite doses are maintained within allowable limits (Ref. 6).

The Spent Fuel Pool water level satisfies Criterion 2 and 3 of 10 CFR 50.36 (Ref. 6).

BASES (continued)

LCO

The specified water level preserves the assumptions of the fuel handling and cask drop accident analyses (Ref. 3). As such, it is the minimum required for fuel storage and movement within the Spent Fuel Pool or movement of the cask over the Spent Fuel Pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the Spent Fuel Pool or movement of the cask over the Spent Fuel Pool since the potential for a release of fission products exists.

ACTIONS

Required Actions A.1 and A.2 are modified by a Note indicating that LCO 3.0.3 does not apply.

If moving irradiated fuel assemblies or a cask while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies or a cask while in MODES 1, 2, 3, and 4, the fuel or cask movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies or a cask is not sufficient reason to require a reactor shutdown.

A.1

When the initial conditions for an accident cannot be met, immediate action must be taken to preclude the occurrence of an accident. With the Spent Fuel Pool at less than the required level, the movement of fuel assemblies in the Spent Fuel Pool is immediately suspended. This effectively precludes the occurrence of a fuel handling accident. In such a case, unit procedures control the movement of other (non cask) loads over the spent fuel. This does not preclude movement of a fuel assembly to a safe position.

A.2

When the initial conditions for an accident cannot be met, immediate action must be taken to preclude the occurrence of an accident. With the Spent Fuel Pool at less than the required level, movement of a cask over the Spent Fuel Pool is immediately suspended. This effectively precludes the occurrence of a cask drop accident. In such a case, unit procedures control the movement of other (non cask) loads over the spent fuel. This does not preclude movement of a cask to a safe position.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that sufficient Spent Fuel Pool water is available in the event of a fuel handling or cask drop accident. The water level in the Spent Fuel Pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by unit procedures and are acceptable, based on operating experience.

During refueling operations, the level in the Spent Fuel Pool is at equilibrium with that in the fuel transfer canal, and the level in the fuel transfer canal is checked daily in accordance with SR 3.9.6.1.

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.11.2.
4. Regulatory Guide 1.183, July 2000.
5. WCAP-7828, December 1971.
6. 10 CFR 50.36

B 3.7 PLANT SYSTEMS

B 3.7.15 Decay Time for Fuel Assemblies in Spent Fuel Pool (SFP)

BASES

BACKGROUND

Spent fuel shipping casks are used to transport irradiated fuel assemblies (FA) from the site and also between the Oconee 1 and 2 spent fuel pool and the Oconee 3 spent fuel pool. Dry storage transfer operations from the spent fuel pool (SFP) buildings to the Independent Spent Fuel Storage Facility (ISFSI) are routinely performed using dry storage transfer casks. Use of these casks requires placing them in the spent fuel pools. Movement of these casks in the spent fuel area creates a potential for a cask to fall into the spent fuel pool, damaging stored fuel assemblies.

APPLICABLE SAFETY ANALYSES

Two hypothetical accident scenarios, the drop of a spent fuel shipping cask and the drop of a dry storage transfer cask onto the irradiated assemblies in the storage racks in the spent fuel pools are considered. The analysis of cask drop accidents in the SFP are presented in UFSAR Section 15.11 (Ref. 1).

The fuel handling accident sequence in which the spent fuel shipping cask impacts on the irradiated fuel assemblies in a spent fuel pool has been evaluated. The analysis has been performed separately for the shared Unit 1 and 2 spent fuel pool and the Unit 3 spent fuel pool. Appropriate conservative assumptions have been employed for determining the number of fuel assemblies damaged. The gap fractions and decontamination factors used are consistent with the guidance in Regulatory Guide 1.183 (Ref. 2).

Based upon the number of fuel assemblies which could be damaged, dose analyses were performed which are consistent with Regulatory Guide 1.183, and NUREG-0612 (Ref. 3). The radiological consequences resulting from a spent fuel shipping cask accident in either the Unit 1 and 2 SFP or the Unit 3 SFP were analyzed including assumptions regarding irradiated fuel decay time and associated storage location. Irradiated fuel stored in the first 36 rows of the Unit 1 and 2 spent fuel pool closest to the spent fuel cask handling area are assumed to have been decayed at least 55 days. Fuel assemblies assumed damaged in excess of two full cores (354 assemblies) in the unit 1 and 2 SFP are assumed to have decayed at least

BASES

APPLICABLE SAFETY ANALYSES (continued)

one year. Irradiated fuel assemblies stored in the first 33 rows of the Unit 3 spent fuel pool closest to the spent fuel cask handling area are assumed to have decayed at least 70 days. Fuel assemblies assumed damaged in excess of one full core (177 assemblies) in the Unit 3 SFP are assumed to have decayed at least one year. The radiological consequences resulting from a dry storage transfer cask drop accident into either the Unit 1 and 2 or the Unit 3 SFP were analyzed. The analysis has been performed separately for the shared Unit 1 and 2 spent fuel pool and the Unit 3 spent fuel pool. The analysis for the Unit 1 and 2 SFP assumes that fuel stored in the first 64 rows closest to the cask handling area have been decayed a minimum of 65 days. Likewise, all irradiated FAs stored in the Unit 3 pool are assumed to have been decayed a minimum of 57 days. These decay time assumptions, in addition to other assumptions consistent with Regulatory Guide 1.183 were used to determine the curies of each nuclide released from the postulated dry storage transfer cask drop accident. The total activity releases for each pool were used to determine the corresponding offsite dose consequences.

The offsite radiological consequences of the postulated cask drop accidents are within the 10 CFR 50.67 guidelines.

Decay Time for Fuel Assemblies in Spent Fuel Pool (SFP) satisfies Criterion 2 of 10 CFR 50.36 (Ref. 4).

LCO

The LCO requires that irradiated fuel assemblies in the specified storage locations be decayed at least as long as the minimum time specified. The specified decay time limits are dependent upon the combination of the specific cask being used and the SFP area in which the cask movement is taking place.

APPLICABILITY

The LCO applies during movement of either the spent fuel shipping cask or the dry storage transfer cask in the SFP area. When a cask is not being moved in the SFP area, the potential for a cask drop accident does not exist. The SFP area includes the area immediately surrounding the SFP itself but does not include the truck bay area since its elevation is well below the SFP area.

BASES (continued)

ACTIONS

A.1

When the requirements of the LCO are not met, immediate action must be taken to preclude the occurrence of an accident.

This is most efficiently achieved by immediately suspending the movement of the cask associated with the LCO which is not met. This does not preclude movement of the cask to a safe position.

The Required Action is modified by a Note indicating that LCO 3.0.3 does not apply. If moving the cask while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving the cask while in MODE 1, 2, 3, or 4, the cask movement is independent of reactor operation. Therefore, inability to suspend movement of cask is not a sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies by administrative means that the decay time of the fuel assemblies are in accordance with the accompanying LCO.

REFERENCES

1. UFSAR, Section 15.11
2. Regulatory Guide 1.183, July 2000
3. NUREG-0612
4. 10 CFR 50.36

Attachment #2

Markup of current Bases

B 3.7 PLANT SYSTEMS

B 3.7.11 Spent Fuel Pool Water Level

BASES

BACKGROUND

The minimum water level in the Spent Fuel Pool 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.

A general description of the Spent Fuel Pool design is given in the UFSAR, Section 9.1.2, Reference 1. The Spent Fuel Pool Cooling and Cleanup System is given in the UFSAR, Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident or cask drop are given in the UFSAR, Section 15.11.2 (Ref. 3).

APPLICABLE SAFETY ANALYSES

During movement of irradiated fuel assemblies or crane operations with loads in the Spent Fuel Pool, the water level in the pool is an initial condition design parameter in the analysis of the fuel handling accident and cask drop accidents in the fuel pool. A minimum water level of 23 ft ~~(Regulatory Position C.1.c of~~ Ref. 4) allows a decontamination factor (DF) of ~~100~~ 200 ~~(Regulatory Position C.1.g of~~ Ref. 4) to be used in the accident analysis for iodine. ~~This relates to the assumption that 99% of the total iodine released from the pellet to cladding gap of all the damaged fuel assembly(ies) rods is retained by the Spent Fuel Pool water. The fuel pellet to cladding gap is assumed to contain 10% of the total fuel rod iodine inventory (Ref. 4).~~

The fuel handling accident and cask drop accident analysis in the Spent Fuel Pool is described in Reference 3. Since the minimum water level of 21.34 feet is less than 23 feet, the assumed iodine DF must be less than ~~100,~~ 200 according to Ref. 4, and calculated with comparable conservatism. Oconee's analysis assumes the top of the irradiated fuel assemblies as the top of the fuel pins (Refs. 4 ~~and 8~~). An experimental test program described in WCAP-7828 (Ref. ~~6~~ 5) evaluated the extent of removal of iodine released from a damaged irradiated fuel assembly. Using the analytical results from the test program described in ~~WCAP-7828~~, with a water depth of 21.34 feet, a comparable DF of ~~89~~ 183 was determined. With a minimum water level of 21.34 ft, and a minimum decay time of 72 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated fuel handling or cask drop accident is adequately captured by the water and offsite doses are maintained within allowable limits (Ref. ~~7~~ 6).

BASES

APPLICABLE SAFETY ANALYSES

The Spent Fuel Pool water level satisfies Criterion 2 and 3 of 10 CFR 50.36 (Ref. ~~7~~ 6).

LCO

The specified water level preserves the assumptions of the fuel handling and cask drop accident analyses (Ref. 3). As such, it is the minimum required for fuel storage and movement within the Spent Fuel Pool or movement of the cask over the Spent Fuel Pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the Spent Fuel Pool or movement of the cask over the Spent Fuel Pool since the potential for a release of fission products exists.

ACTIONS

Required Actions A.1 and A.2 are modified by a Note indicating that LCO 3.0.3 does not apply.

If moving irradiated fuel assemblies or a cask while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies or a cask while in MODES 1, 2, 3, and 4, the fuel or cask movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies or a cask is not sufficient reason to require a reactor shutdown.

A.1

When the initial conditions for an accident cannot be met, immediate action must be taken to preclude the occurrence of an accident. With the Spent Fuel Pool at less than the required level, the movement of fuel assemblies in the Spent Fuel Pool is immediately suspended. This effectively precludes the occurrence of a fuel handling accident. In such a case, unit procedures control the movement of other (non cask) loads over the spent fuel. This does not preclude movement of a fuel assembly to a safe position.

BASES

ACTIONS (continued)

A.2

When the initial conditions for an accident cannot be met, immediate action must be taken to preclude the occurrence of an accident. With the Spent Fuel Pool at less than the required level, movement of a cask over the Spent Fuel Pool is immediately suspended. This effectively precludes the occurrence of a cask drop accident. In such a case, unit procedures control the movement of other (non cask) loads over the spent fuel. This does not preclude movement of a cask to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that sufficient Spent Fuel Pool water is available in the event of a fuel handling or cask drop accident. The water level in the Spent Fuel Pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by unit procedures and are acceptable, based on operating experience.

During refueling operations, the level in the Spent Fuel Pool is at equilibrium with that in the fuel transfer canal, and the level in the fuel transfer canal is checked daily in accordance with SR 3.9.6.1.

REFERENCES

1. UFSAR, Section 9.1.2.

2. UFSAR, Section 9.1.3.

3. UFSAR, Section 15.11.2.

4. Regulatory Guide ~~1.25.~~ 1.183, July 2000.

~~5. 10 CFR 100.11.~~ (deleted)

5 ~~6~~. WCAP-7828, December 1971.

6 ~~7~~. 10 CFR 50.36

B 3.7 PLANT SYSTEMS

B 3.7.15 Decay Time for Fuel Assemblies in Spent Fuel Pool (SFP)

BASES

BACKGROUND

Spent fuel shipping casks are used to transport irradiated fuel assemblies (FA) from the site and also between the Oconee 1 and 2 spent fuel pool and the Oconee 3 spent fuel pool. Dry storage transfer operations from the spent fuel pool (SFP) buildings to the Independent Spent Fuel Storage Facility (ISFSI) are routinely performed using dry storage transfer casks. Use of these casks requires placing them in the spent fuel pools. Movement of these casks in the spent fuel area creates a potential for a cask to fall into the spent fuel pool, damaging stored fuel assemblies.

APPLICABLE SAFETY ANALYSES

Two hypothetical accident scenarios, the drop of a spent fuel shipping cask and the drop of a dry storage transfer cask onto the irradiated assemblies in the storage racks in the spent fuel pools are considered. The analysis of cask drop accidents in the SFP are presented in UFSAR Section 15.11 (Ref. 1).

The fuel handling accident sequence in which the spent fuel shipping cask impacts on the irradiated fuel assemblies in a spent fuel pool has been evaluated. The analysis has been performed separately for the shared Unit 1 and 2 spent fuel pool and the Unit 3 spent fuel pool. Appropriate conservative assumptions have been employed for determining the number of fuel assemblies damaged. The gap fractions and decontamination factors used are consistent with the guidance in Regulatory Guide ~~1.25~~ 1.183 (Ref. 2).

Based upon the number of fuel assemblies which could be damaged, dose analyses were performed which are consistent with Regulatory Guide ~~1.25~~, 1.183 and NUREG-0612 (Ref. 3). The radiological consequences resulting from a spent fuel shipping cask accident in either the Unit 1 and 2 SFP or the Unit 3 SFP were analyzed including assumptions regarding irradiated fuel decay time and associated storage location. Irradiated fuel stored in the first 36 rows of the Unit 1 and 2 spent fuel pool closest to the spent fuel cask handling area are assumed to have been decayed at least 55 days. Fuel assemblies assumed damaged in excess of two full cores (354 assemblies) in the unit 1 and 2 SFP are assumed to have decayed at least

BASES

APPLICABLE SAFETY ANALYSES (continued)

one year. Irradiated fuel assemblies stored in the first 33 rows of the Unit 3 spent fuel pool closest to the spent fuel cask handling area are assumed to have decayed at least 70 days. Fuel assemblies assumed damaged in excess of one full core (177 assemblies) in the Unit 3 SFP are assumed to have decayed at least one year. The radiological consequences resulting from a dry storage transfer cask drop accident into either the Unit 1 and 2 or the Unit 3 SFP were analyzed. The analysis has been performed separately for the shared Unit 1 and 2 spent fuel pool and the Unit 3 spent fuel pool. The analysis for the Unit 1 and 2 SFP assumes that fuel stored in the first 64 rows closest to the cask handling area have been decayed a minimum of 65 days. Likewise, all irradiated FAs stored in the Unit 3 pool are assumed to have been decayed a minimum of 57 days. These decay time assumptions, in addition to other assumptions consistent with Regulatory Guide ~~1.25~~ 1.183 were used to determine the curies of each nuclide released from the postulated dry storage transfer cask drop accident. The total activity releases for each pool were used to determine the corresponding offsite dose consequences.

The offsite radiological consequences of the postulated cask drop accidents are within the 10 CFR ~~100~~ 50.67 guidelines.

Decay Time for Fuel Assemblies in Spent Fuel Pool (SFP) satisfies Criterion 2 of 10 CFR 50.36 (Ref. 4).

LCO

The LCO requires that irradiated fuel assemblies in the specified storage locations be decayed at least as long as the minimum time specified. The specified decay time limits are dependent upon the combination of the specific cask being used and the SFP area in which the cask movement is taking place.

APPLICABILITY

The LCO applies during movement of either the spent fuel shipping cask or the dry storage transfer cask in the SFP area. When a cask is not being moved in the SFP area, the potential for a cask drop accident does not exist. The SFP area includes the area immediately surrounding the SFP itself but does not include the truck bay area since its elevation is well below the SFP area.

BASES (continued)

ACTIONS

A.1

When the requirements of the LCO are not met, immediate action must be taken to preclude the occurrence of an accident.

This is most efficiently achieved by immediately suspending the movement of the cask associated with the LCO which is not met. This does not preclude movement of the cask to a safe position.

The Required Action is modified by a Note indicating that LCO 3.0.3 does not apply. If moving the cask while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving the cask while in MODE 1, 2, 3, or 4, the cask movement is independent of reactor operation. Therefore, inability to suspend movement of cask is not a sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies by administrative means that the decay time of the fuel assemblies are in accordance with the accompanying LCO.

REFERENCES

1. UFSAR, Section 15.11
2. Regulatory Guide ~~1.25~~ 1.183, July 2000.
3. NUREG-0612
4. 10 CFR 50.36