Duke Power®

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September 19, 2005

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
Proposed Technical Specifications and Bases Amendment
Technical Specification and Bases 3.6.10
Annulus Ventilation System (AVS)
Technical Specification and Bases 3.6.16
Reactor Building
Technical Specification Bases 3.7.10
Control Room Area Ventilation System (CRAVS)
Technical Specification Bases 3.7.12
Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)
Technical Specification Bases 3.7.13
Fuel Handling Ventilation Exhaust System (FHVES)
Technical Specification and Bases 3.9.3
Containment Penetrations
Technical Specification 5.5.11
Ventilation Filter Testing Program (VFTP)
TAC Numbers MB7014 and MB7015

References: Letters from Duke Energy Corporation to NRC, dated November 25, 2002, November 13, 2003, December 16, 2003, September 22, 2004, April 6, 2005, June 14, 2005, July 8, 2005, August 17, 2005, and September 8, 2005

The reference letters comprise Duke Energy Corporation's collective submittal to date concerning the subject license amendment request. On September 8, 2005, the NRC provided Catawba a Request for Additional Information (RAI) via electronic mail. The purpose of this letter is to reply to this RAI. The format of the reply is to restate the RAI question, followed by our response. The RAI reply is contained in the attachment to this letter.

A001

Catawba Nuclear Station 20th Anniversary 1985-2005

Pursuant to 10 CFR 50.91, a copy of this letter is being sent to the appropriate State of South Carolina official.

Inquiries on this matter should be directed to L.J. Rudy at (803) 831-3084.

Very truly yours,

D.M. Jamil

LJR/s

Attachment

D.M. Jamil affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

D.M. Jamil, Vice President

Subscribed and sworn to me: 9-19-05
Date

Anthony P. Jackson
Notary Public

My commission expires: 7-2-2014
Date

SEAL

xc (with attachment):

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ATTACHMENT

REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION

Catawba Technical Specification License Amendment Request (MB7014/5)

Regarding the September 8, 2005 response to NRC's Question 4 concerning the PORV and MSSV X/Q values, Duke provided an estimate of the 95 percentile wind speed (12 mph) for the height of wind measurement (10 meters) rather than at the height of the PORVs and MSSVs (16.8 meters). The estimated 95 percentile wind speed at 16.8 meters is slightly higher than at 10 meters. In addition, in response to a question asking for the minimum flow velocity from the PORVs and MSSVs at any time of release, Duke provided an estimate of choked condition steam pressures down to 32.4 psia with a corresponding saturation temperature of 255 degrees F, stating that the minimum flow velocity will remain above 60 mph which is a factor of five higher than the 12 mph wind speed as specified in Regulatory Guide 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants." However, if the 95 percentile wind speed at 16.8 meters is higher than 12 mph, the minimum flow velocity would need to be higher than 60 mph to meet the factor of five specified in the regulatory guide.

How much above 60 mph does the flow velocity remain? Also, confirm that this velocity represents conditions at any time during the accident (e.g., even if pressure and/or temperature changes with time). It is our understanding that at some plants under some conditions, operators might use valves to change pressure/temperature to mitigate potential consequences of an accident and this could have an impact on the velocity of the effluent release.

Duke Energy Corporation Response:

The Auxiliary Feedwater (AFW) turbine driven pump (TDP) exhaust vent previously had been taken as the design basis release point for all steam generator (SG) doghouse releases in the calculation of atmospheric dispersion factors for transport of fission products to one or both Control Room Area Ventilation System (CRAVS) outside air intakes (control room χ/Q values). The AFW TDP exhaust vent for each Catawba nuclear unit is located on the roof of its inboard SG doghouse. The vents for the Main Steam Safety Valves (MSSVs) and SG Power Operated Relief Valves (PORVs) on the outboard SG doghouses are closer to the CRAVS outside air intakes. However, it had been stated that if the vertical velocity and temperature of the releases are taken into account, the control room χ/Q values for releases from the

outboard SG doghouse vents would be smaller than the control room χ/Q values for releases from the AFW TDP exhaust vents. It was determined that the control room χ/Q values for releases from the AFW TDP exhaust vents exceeded one-fifth the control room χ/Q values for releases from the outboard SG doghouse steam vents (Ref. 1, 2).

The NRC Staff has questioned the evaluation of Duke Energy Corporation concerning the limiting SG doghouse steam release vent (Ref. 2 and the question above). In response to this question, Duke Energy Corporation performed a review of the method for selection of the design basis point of release of fission products from the SG doghouse steam vents. In the review, an evaluation was completed to determine whether a method could be developed to calculate design basis values for velocities for steam releases from the vents of 5 times the 95^{th} percentile wind speed at the elevation of the releases. This is one of the conditions which must be met to divide a set of control room χ/Q values by five (Ref. 4).

The 95^{th} percentile wind speed at the elevation of the releases from the SG PORVs and MSSVs at Catawba is 17.0 mph. A calculation would have to show that the velocity of the release from the vents for the steam release vents (in particular, the SG PORVs since following a design basis accident, steam would be released from the SG PORVs) is at least 85 mph. From a review of the piping drawings for the SG PORVs, a number of difficulties with such a calculation were identified. The piping between each SG PORV and its vent include a silencer and a number of diameter changes. In addition, the releases may include condensed steam. This introduces the possibility of slip (water droplets moving more slowly than steam).

As a result of this review and evaluation, Duke Energy Corporation designates the limiting outboard SG doghouse release point as the design basis SG doghouse steam vent. This is the MSSV vent on the Unit 2 outboard SG doghouse closer to the Unit 2 CRAVS outside air intake.

Only one CRAVS outside air intake is in a 90° wind direction window. Therefore, the control room χ/Q values calculated with ARCON96 are multiplied by the design basis flow weight factor (0.6) to produce the control room χ/Q values for both CRAVS outside air intakes open.

The control room χ/Q values for releases from the steam vents on the SG doghouses are presented below.

Time Span (hr)	Control room χ/Q values (sec/m^3) ARCON96	Composite
0 - 2	1.19×10^{-2}	7.14×10^{-3}
2 - 8	6.75×10^{-3}	4.05×10^{-3}
8 - 10	3.74×10^{-3}	2.24×10^{-3}
10 - 24	3.02×10^{-3}	1.81×10^{-3}
24 - 96	2.06×10^{-3}	1.24×10^{-3}
96 - 720	1.21×10^{-3}	7.26×10^{-4}

The analysis of radiological consequences of the design basis (DB) locked rotor accident (LRA) and rod ejection accident (REA) (Ref. 3, 5) was revised. In the revised analysis, radiation doses in the control room were recalculated using the composite control room χ/Q values.

The control room radiation doses for the DB LRA are given as follows:

CNS DB LRA Scenario	Control Room TEDE (Rem)
CNS Unit 1 DB LRA with LOOP, all LEU core	0.73
CNS Unit 1 DB LRA with LOOP, 4 MOX LFAs	0.80
CNS Unit 2 DB LRA with LOOP, all LEU core	1.36
CNS Unit 2 DB LRA with LOOP, 4 MOX LFAs	1.48

The control room radiation doses for the DB REA are given as follows:

CNS DB REA Scenario	Control Room TEDE (Rem)
CNS Unit 1 DB REA, no LOOP, all LEU core	
SG releases	0.73
Releases to containment	1.74
Total	2.47
CNS Unit 1 DB REA, no LOOP, 4 MOX LFAs	
SG releases	0.74
Releases to containment	1.76
Total	2.50
CNS Unit 2 DB REA, no LOOP, all LEU core	
SG releases	1.11
Releases to containment	1.74
Total	2.85
CNS Unit 2 DB REA, no LOOP, 4 MOX LFAs	
SG releases	1.13
Releases to containment	1.76
Total	2.89

Notes on table:

1) Control room TEDEs are recalculated here only for radioactivity releases from the SGs following a DB REA. Control room TEDEs for post REA releases to containment are taken from the letter from Duke Energy Corporation to the NRC dated August 17, 2005 (Ref. 3).

2) The constituents to the control room TEDEs listed for post REA releases to containment correspond to post REA containment leakage. For all CNS DB REA scenarios, containment leakage yielded higher TEDEs in the control room than post REA leakage from Engineered Safety Features (ESF) systems (Ref. 3, 5).

For the CNS DB LRA and REA, all control room TEDEs remain within the regulatory limit of 5 Rem.

REFERENCES

1) D.M. Jamil to U.S. Nuclear Regulatory Commission, "Duke Energy Corporation Catawba Nuclear Station, Units 1 and 2, Docket Nos. 50-413 and 50-414, Proposed Technical Specifications and Bases Amendment, Technical Specification and Bases 3.6.10 Annulus Ventilation System (AVS), Technical Specification and Bases 3.6.16 Reactor Building, Technical Specification Bases 3.7.10 Control Room Area Ventilation System (CRAVS), Technical Specification Bases 3.7.12 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), Technical Specification Bases 3.7.13 Fuel Handling Ventilation Exhaust System (FHVES), Technical Specification and Bases 3.9.3 Containment Penetrations, Technical Specification 5.5.11 Ventilation Filter Testing Program (VFTP), TAC Numbers MB7014 and MB7015," November 13, 2003.

2) D.M. Jamil to U.S. Nuclear Regulatory Commission, "Duke Energy Corporation Catawba Nuclear Station, Units 1 and 2, Docket Nos. 50-413 and 50-414, Proposed Technical Specifications and Bases Amendment, Technical Specification and Bases 3.6.10 Annulus Ventilation System (AVS), Technical Specification and Bases 3.6.16 Reactor Building, Technical Specification Bases 3.7.10 Control Room Area Ventilation System (CRAVS), Technical Specification Bases 3.7.12 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), Technical Specification Bases 3.7.13 Fuel Handling Ventilation Exhaust System (FHVES), Technical Specification and Bases 3.9.3 Containment Penetrations, Technical Specification 5.5.11 Ventilation Filter Testing Program (VFTP), TAC Numbers MB7014 and MB7015," September 8, 2005.

3) D.M. Jamil to U.S. Nuclear Regulatory Commission, "Duke Energy Corporation Catawba Nuclear Station, Units 1 and 2, Docket Nos. 50-413 and 50-414, Proposed Technical Specifications and Bases Amendment, Technical Specification and Bases 3.6.10 Annulus Ventilation System (AVS), Technical Specification and Bases 3.6.16 Reactor Building, Technical Specification Bases 3.7.10 Control Room Area Ventilation System (CRAVS), Technical Specification Bases 3.7.12 Auxiliary Building Filtered

Ventilation Exhaust System (ABFVES), Technical Specification Bases 3.7.13 Fuel Handling Ventilation Exhaust System (FHVES), Technical Specification and Bases 3.9.3 Containment Penetrations, Technical Specification 5.5.11 Ventilation Filter Testing Program (VFTP), TAC Numbers MB7014 and MB7015," August 17, 2005.

4) USNRC, Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants, Regulatory Guide (R.G.) 1.194, June 2003.

5) D.M. Jamil to U.S. Nuclear Regulatory Commission, "Duke Energy Corporation Catawba Nuclear Station, Units 1 and 2, Docket Nos. 50-413 and 50-414, Proposed Technical Specifications and Bases Amendment, Technical Specification and Bases 3.6.10 Annulus Ventilation System (AVS), Technical Specification and Bases 3.6.16 Reactor Building, Technical Specification Bases 3.7.10 Control Room Area Ventilation System (CRAVS), Technical Specification Bases 3.7.12 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), Technical Specification Bases 3.7.13 Fuel Handling Ventilation Exhaust System (FHVES), Technical Specification and Bases 3.9.3 Containment Penetrations, Technical Specification 5.5.11 Ventilation Filter Testing Program (VFTP), TAC Numbers MB7014 and MB7015," April 6, 2005.