



Serial: NPD-NRC-2009-024
February 19, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

**SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 2 AND 3
DOCKET NOS. 52-022 AND 52-023
SUPPLEMENT 1 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER
NO. 003 RELATED TO SHORT TERM ATMOSPHERIC DISPERSION ESTIMATES FOR
ACCIDENT RELEASES**

Reference: Letter from Manny Comar (NRC) to James Scarola (PEC), dated August 13, 2008,
"Request for Additional Information Letter No. 003 Related to SRP Section
02.03.04 for the Harris Units 2 and 3 Combined License Application"

Letter from James Scarola (PEC) to U. S. Nuclear Regulatory Commission (NRC),
dated September 5, 2008, "Response to Request for Additional Information Letter
No. 003 Related to Short Term Atmospheric Dispersion Estimates for Accident
Releases," Serial: NPD-NRC-2008-029

Ladies and Gentlemen:

Progress Energy Carolinas, Inc. (PEC) hereby submits a supplementary response to the Nuclear
Regulatory Commission's (NRC) request for additional information provided in the referenced
letter.

A revised response to the NRC request is addressed in the enclosure. The enclosure also
identifies changes that will be made in a future revision of the Shearon Harris Nuclear Power Plant
Units 2 and 3 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at
(919) 546-6992, or me at (919) 546-6107.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 19, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosure

Progress Energy Carolinas, Inc.
P.O. Box 1551
Raleigh, NC 27602

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NRO

cc : U.S. NRC Director, Office of New Reactors/NRLPO
U.S. NRC Office of Nuclear Reactor Regulation/NRLPO
U.S. NRC Region II, Regional Administrator
U.S. NRC Resident Inspector, SHNPP Unit 1
Mr. Manny Comar, U.S. NRC Project Manager

**Shearon Harris Nuclear Power Plant Units 2 and 3
Supplement 1 to Response to NRC Request for Additional Information Letter No. 003
Related to SRP Section 02.03.04 for the Combined License Application,
dated August 13, 2008**

<u>NRC RAI #</u>	<u>Progress Energy RAI #</u>	<u>Progress Energy Response</u>
02.03.04-1	H-0413	Revised response enclosed – see following pages
02.03.04-2	H-0416	Revised response enclosed – see following pages
02.03.04-3	H-0034	September 5, 2008; Serial: NPD-NRC-2008-029

NRC Letter No.: HAR-RAI-LTR-003

NRC Letter Date: August 13, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.04-1

Text of NRC RAI:

Please ensure that the control room ground-level containment X/Q values for the HVAC intake and control room door receptors, as presented in FSAR Table 2.3.4-206, are listed correctly. An independent calculation by the staff showed that the control room ground-level containment X/Q values for the HVAC intake and control room door receptors varied more than 60% than those stated. Please revise these numbers to show correct values or provide justification for the numbers.

PGN RAI ID #: H-0413

PGN Response to NRC RAI:

The values in HAR FSAR Table 2.3.4-206 are based on the AP1000 DCD Rev. 15 data for source-receptor distances and angles. AP1000 DCD Rev. 15 updated DCD Figure 15A-1 to adjust the layout, which affects the source-receptor angles. Subsequently, AP1000 DCD Rev. 17 revised the source-receptor distances and the Control Room X/Q acceptance criteria. An estimate of the differences in the Control Room X/Q values using the updated Westinghouse data versus the AP1000 DCD Rev. 15 values for HAR is that the X/Q values would be about 50% lower for the control room door and 85% lower for the HVAC intake. Due to the timing of the release of AP1000 DCD Rev. 17, the HAR FSAR was submitted with control room X/Q values based on DCD Rev. 15.

The HAR FSAR will be revised in a future amendment to reflect the revised Control Room X/Q calculations based on the AP1000 DCD Rev. 17, source-receptor data.

Associated HAR COL Application Revisions:

The following changes will be made to HAR FSAR Chapter 2 in a future revision:

Replace FSAR Tables 2.3.4-206 and 2.3.4-207 with the versions provided on the following pages.

Attachments/Enclosures:

None.

Table 2.3.4-206
Comparison of Control Room Atmospheric Dispersion Factors for Accident Analysis for AP1000 DCD and HAR Units 2 & 3 (Sheet 1 of 2)

X/Q (sec/m³) at HVAC Intake for the Identified Release Points^(a)

	Plant Vent or PCS Air Diffuser ^(b)	Plant Vent	PCS Air Diffuser	Ground Level Containment Release Points ^(c,h)	Ground Level Containment Release Points	PORV and Safety Valve Releases ^(d)	PORV and Safety Valve Releases	Condenser Air Removal Stack ^(g)	Condenser Air Removal Stack	Steam Line Break Releases	Steam Vent	Fuel Handling Area ^(e)	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	DCD	HAR	HAR	DCD	HAR 2 and HAR 3	DCD	HAR	DCD	HAR 2 and HAR 3	DCD	HAR	DCD	HAR	HAR
0 - 2 hours	3.0E-03	2.0E-03	1.6E-03	6.0E-03	4.2E-03	2.0E-02	1.2E-02	6.0E-03	1.5E-03	2.4E-02	1.4E-02	6.0E-03	1.4E-03	1.1E-03
2 - 8 hours	2.5E-03	1.4E-03	1.1E-03	3.6E-03	3.2E-03	1.8E-02	1.0E-02	4.0E-03	1.2E-03	2.0E-02	1.1E-02	4.0E-03	1.0E-03	8.3E-04
8 - 24 hours	1.0E-03	6.1E-04	4.9E-04	1.4E-03	1.2E-03	7.0E-03	4.2E-03	2.0E-03	5.1E-04	7.5E-03	4.6E-03	2.0E-03	4.5E-04	3.7E-04
1 - 4 days	8.0E-04	4.5E-04	3.4E-04	1.8E-03	1.2E-03	5.0E-03	3.1E-03	1.5E-03	3.4E-04	5.5E-03	3.4E-03	1.5E-03	3.2E-04	2.6E-04
4 - 30 days	6.0E-04	3.5E-04	3.0E-04	1.5E-03	1.0E-03	4.5E-03	2.6E-03	1.0E-03	2.6E-04	5.0E-03	2.8E-03	1.0E-03	2.5E-04	2.1E-04

X/Q (sec/m³) at Control Room Door for the Identified Release Points^(f)

	Plant Vent or PCS Air Diffuser ^(b)	Plant Vent	PCS Air Diffuser	Ground Level Containment Release Points ^(c)	Ground Level Containment Release Points	PORV and Safety Valve Releases ^(d)	PORV and Safety Valve Releases	Condenser Air Removal Stack ^(g)	Condenser Air Removal Stack	Steam Line Break Releases	Steam Vent	Fuel Handling Area ^(e)	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	DCD	HAR	HAR	DCD	HAR	DCD	HAR	DCD	HAR	DCD	HAR	DCD	HAR	HAR
0 - 2 hours	1.0E-03	4.2E-04	4.3E-04	1.0E-03	3.6E-04	4.0E-03	8.6E-04	2.0E-02	3.4E-03	4.0E-03	8.4E-04	6.0E-03	3.4E-04	3.3E-04
2 - 8 hours	7.5E-04	3.2E-04	3.1E-04	7.5E-04	2.9E-04	3.2E-03	6.2E-04	1.8E-02	2.6E-03	3.2E-03	5.9E-04	4.0E-03	2.5E-04	2.4E-04
8 - 24 hours	3.5E-04	1.4E-04	1.4E-04	3.5E-04	1.4E-04	1.2E-03	2.6E-04	7.0E-03	1.2E-03	1.2E-03	2.5E-04	2.0E-03	1.1E-04	1.1E-04
1 - 4 days	2.8E-04	1.1E-04	1.0E-04	2.8E-04	1.0E-04	1.0E-03	2.0E-04	5.0E-03	7.1E-04	1.0E-03	1.9E-04	1.5E-03	8.2E-05	8.0E-05
4 - 30 days	2.5E-04	8.3E-05	8.4E-05	2.5E-04	8.9E-05	8.0E-04	1.6E-04	4.5E-03	6.0E-04	8.0E-04	1.5E-04	1.0E-03	6.7E-05	6.5E-05

Table 2.3.4-206
Comparison of Control Room Atmospheric Dispersion Factors for Accident Analysis for AP1000 DCD and HAR Units 2 & 3 (Sheet 2 of 2)

- a. These dispersion factors are to be used 1) for the time period preceding the isolation of the main control room and actuation of the emergency habitability system, 2) for the time after 72 hours when the compressed air supply in the emergency habitability system would be exhausted and outside air would be drawn into the main control room, and 3) for the determination of control room doses when the non-safety ventilation system is assumed to remain operable such that the emergency habitability system is not actuated.
- b. These dispersion factors are used for analysis of the doses due to a postulated small line break outside of containment. The plant vent and PCS air diffuser are potential release paths for other postulated events (loss of-coolant accident, rod ejection accident, and fuel handling accident inside the containment); however, the values are bounded by the dispersion factors for ground level releases.
- c. The listed values represent modeling the containment shell as a diffuse area source, and are used for evaluating the doses in the main control room for a loss-of-coolant accident, for the containment leakage of activity following a rod ejection accident, and for a fuel handling accident occurring inside the containment.
- d. The listed values bound the dispersion factors for releases from the steam line safety & power-operated relief valves. These dispersion factors would be used for evaluating the doses in the main control room for a steam generator tube rupture, a main steam line break, a locked reactor coolant pump rotor, and for the secondary side release from a rod ejection accident.
- e. The listed values bound the dispersion factors for releases from the fuel storage and handling area. The listed values also bound the dispersion factors for releases from the fuel storage area in the event that spent fuel boiling occurs and the fuel handling area relief panel opens on high temperature. These dispersion factors are used for the fuel handling accident occurring outside containment and for evaluating the impact of releases associated with spent fuel pool boiling.
- f. These dispersion factors are to be used when the emergency habitability system is in operation and the only path for outside air to enter the main control room is that due to ingress/egress.
- g. This release point is included for information only as a potential activity release point. None of the design basis accident radiological consequences analyses model release from this point.
- h. The LOCA dose analysis models the ground level containment release point HVAC intake atmospheric dispersion factors. Other analyses model more conservative values.

Table 2.3.4-207
Control Room Release/Receptor Azimuthal Angles for Input to ARCON96

Release Location	Receptor Location	
	Control Room HVAC Intake (degrees)	Annex Building Access (degrees)
Plant Vent	261	262
PCS Air Diffuser	291	273
Containment Shell (Diffuse Area Source)	284	267
Fuel Building Blowout Panel	244	254
Radwaste Building Truck Staging Area Door	235	249
Steam Vent	336	277
PORV/Safety Valves	346	279
Condenser Air Removal Stack	75	310

NRC Letter No.: HAR-RAI-LTR-003

NRC Letter Date: August 13, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.04-2

Text of NRC RAI:

Please include a footnote, similar to the AP1000, Rev. 16, DCD Table 15-A6, in either FSAR Table 2.3.4-206 or FSAR Table 2.3.4-207 clarifying why the Plant Vent / PCS Air Diffuser release points were listed, but no X/Q values were presented.

PGN RAI ID #: H-0416

PGN Response to NRC RAI:

Values for the Plant Vent / PCS Air Diffuser release points were calculated for HAR but were inadvertently not included in HAR FSAR Table 2.3.4-206. Rather than a footnote, the calculated X/Qs will be added to HAR FSAR Table 2.3.4-206 in a future amendment. The values to be added are provided in the Response to RAI 02.03.04-1.

Associated HAR COL Application Revisions:

See the response to RAI 02.03.04-1 (PGN RAI ID H-0413).

Attachments/Enclosures to Response to NRC:

None.