



James Scarola
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Serial: NPD-NRC-2008-027
August 29, 2008

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
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 001 RELATED TO
LOCAL METEOROLOGY**

Reference: Letter from Manny Comar (NRC) to James Scarola (PEC), dated August 1, 2008,
"Request for Additional Information Letter No. 001 Related to SRP Section
02.03.02 for the Harris Units 2 and 3 Combined License Application

Ladies and Gentlemen:

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

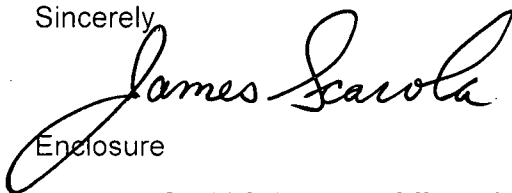
A response to each NRC request is addressed in the enclosure. The enclosure also identifies
changes that will be made in a future revision of the Shearon Harris Nuclear Power Plant Units 2
and 3 application.

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

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

Executed on August 29, 2008.

Sincerely,



Enclosure

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

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**Shearon Harris Nuclear Power Plant Units 2 and 3
Responses to NRC Request for Additional Information Letter No. 001 Related to SRP Section
02.03.02 for the Combined License Application dated August 1, 2008**

<u>NRC RAI #</u>	<u>Progress Energy RAI #</u>	<u>Progress Energy Response</u>
02.03.02-1	H-0014	Response enclosed – see following pages
02.03.02-2	H-0015	Response enclosed – see following pages
02.03.02-3	H-0016	Response enclosed – see following pages
02.03.02-4	H-0017	Response enclosed – see following pages
02.03.02-5	H-0018	Response enclosed – see following pages
02.03.02-6	H-0019	Response enclosed – see following pages
02.03.02-7	H-0020	Response enclosed – see following pages
02.03.02-8	H-0021	Response enclosed – see following pages

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-1

Text of NRC RAI:

As shown in FSAR Table 2.3.2-214, during the data period of record from March 1, 1994 through February 28, 1999, there were 986 hours of calm wind speeds reported. Based on the hourly data submitted, the staff found 2365 hours with a wind speed of 0.5 meters per second (m/s), 1431 hours with a wind speed of 0.4 m/s, 652 hours with a wind speed of 0.3 m/s, 363 hours with a wind speed of 0.2 m/s, 96 hours with a wind speed of 0.1 m/s, and 11 hours of 0.0 m/s. Given the lowest wind speed category of 1 - 3 miles per hour (mph), as specified in the joint frequency distributions provided, the staff found the number of hours with a wind speed below 1 mph (0.45 m/s) equal to 2553 hours. Please explain the basis for the 986 hours of calm wind speed reported in the FSAR.

PGN RAI ID #: H-0014

PGN Response to NRC RAI:

The Joint Frequency Distribution (JFD) presented in FSAR Table 2.3.2-214 was based on an analysis of the raw meteorological data file as obtained from the onsite monitoring system. The raw data file contains wind speeds that are recorded in miles per hour (mph) to two decimal places. The lowest indicated wind speed category in Table 2.3.2-214 is "1 - 3 mph," which is inclusive of wind speeds in the range of 0.75 to 3.49 mph. The five years of raw data were sorted by wind speed and the number of occurrences of valid observations with wind speeds ≤ 0.74 mph were determined and documented as calm winds. Since the data contained in the supplemental data file submitted to NRC (in the prescribed RG 1.23 Revision 1 format) has been converted to meters per second (m/s) and is only represented to the nearest 0.1 m/s, significant differences will exist in the number of occurrences of light winds when compared to the number of calm winds that are indicated in Table 2.3.2-214.

Associated HAR COL Application Revisions:

No COLA revisions have been identified associated with this response.

Associated Attachments/Enclosures:

None.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-2

Text of NRC RAI:

The Charlotte February mean daily minimum temperature listed in FSAR Table 2.3.2-255 appears to be incorrect. Based on the stated reference, "National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC), Local Climatological Data, Annual Summary with Comparative Data, 2005 Annual Summary for Charlotte, North Carolina," the temperature value listed should be 33.5 °F, not 3.5 °F. Please clarify this discrepancy.

PGN RAI ID #: H-0015

PGN Response to NRC RAI:

The correct value for the February mean daily minimum temperature for Charlotte is 33.5 °F. This will be revised in a future amendment to the document.

Associated HAR COL Application Revisions:

In FSAR Table 2.3.2-255 "Summary of Mean Daily Temperatures (°F)," the minimum daily temperature for February for Charlotte will be revised from 3.5°F to 33.5°F.

Associated Attachments/Enclosures:

None.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-3

Text of NRC RAI:

Please consider including FSAR Section 2.3.2.1.3, Dew-Point Temperature, as part of the atmospheric moisture discussion, as presented in FSAR Section 2.3.2.1.4 or justify why it is not needed.

PGN RAI ID #: H-0016

PGN Response to NRC RAI:

FSAR Subsection 2.3.2.1.3 "Dew-Point Temperature" will be moved to FSAR Subsection 2.3.2.1.4 in a future amendment to the document.

Associated HAR COL Application Revisions:

The following revisions will be made to the FSAR:

1. Move the entire contents of FSAR Subsection "2.3.2.1.3 Dew-Point Temperature" to a new Subsection "2.3.2.1.4.1 Dew-Point Temperature."
2. Revise the title of the existing FSAR Subsection "2.3.2.1.4.1 Relative Humidity" to "2.3.2.1.4.2 Relative Humidity."

Associated Attachments/Enclosures:

None.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-4

Text of NRC RAI:

It appears to the staff that the units for the 1994 - 1999 precipitation data, as presented in FSAR Table 2.3.2-260, are incorrect. This data may be listed in centimeters instead of inches. Please ensure the precipitation amounts presented in FSAR Table 2.3.2-260 are given in inches.

PGN RAI ID #: H-0017

PGN Response to NRC RAI:

A review of the monthly and annual average on-site precipitation totals in FSAR 2.3.2-260 indicates that the 1994 – 1999 data are actually in centimeters rather than inches as indicated in the table heading. As a result, 1994 – 1999 monthly and annual average values, as well as the average monthly values in the far right column need to be re-calculated to reflect the correct values in inches. These corrections are shown on the attached Table and will also be included in a future amendment to the FSAR.

Associated HAR COL Application Revisions:

A revised version of FSAR Table 2.3.2-260 is provided which shows the corrected precipitation values for 1994–1999 as well as the affected averages.

Associated Attachments/Enclosures:

None.

Table 2.3.2-260
Monthly and Annual Precipitation (in.)
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: January 14, 1976 to December 31, 1978 and March 1, 1994 to February 28, 1999

Month	1976 ^(a)	1977 ^(a)	1978 ^(a)	1994 ^(b)	1995 ^(c)	1996 ^(c)	1997 ^(c)	1998 ^(c)	1999 ^(d)	Average
January	1.29	2.65	7.42	NA	4.09	2.82	2.06	3.22	2.56	3.26
February	1.15	1.57	1.74	NA	5.38	2.23	2.11	3.24	1.06	2.31
March	4.69	6.18	3.85	3.83	2.30	3.14	2.29	6.33	NA	4.08
April	0.43	2.17	4.36	0.58	0.83	3.48	4.51	3.10	NA	2.43
May	2.72	1.87	3.59	3.86	4.60	2.67	1.91	6.26	NA	3.43
June	2.74	0.77	5.08	3.22	5.80	3.11	2.87	1.35	NA	3.12
July	1.66	1.92	4.63	5.56	2.08	5.80	5.54	2.99	NA	3.77
August	1.76	3.78	3.47	3.75	3.02	2.31	0.47	0.79	NA	2.42
September	2.87	6.16	2.72	2.35	2.14	7.09	2.69	2.19	NA	3.53
October	1.26	4.17	0.91	4.90	10.07	3.70	2.25	1.57	NA	3.60
November	1.14	2.35	3.57	1.37	3.35	2.42	1.96	0.95	NA	2.14
December	3.66	3.08	2.85	1.11	1.09	1.98	1.83	0.60	NA	2.03
Annual	25.37	36.67	44.19	30.54	44.74	40.76	30.50	32.61	3.62	32.11

Sources:

- a) Period of Record: January 14, 1976 to December 31, 1978 (HNP FSAR).
- b) Period of Record: March 1, 1994 to December 31, 1994.
- c) Period of Record: January 1 to December 31 of indicated year.
- d) Period of Record: January 1, 1999 to February 28, 1999.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-5

Text of NRC RAI:

FSAR Section 2.3.2.1.7 states that an assessment of atmospheric stability distributions from 1976 - 1978 and 1994 - 1999 onsite data would be expected to yield similar distributions. Attachment 1 shows a comparison of these distributions based on data presented in the FSAR. Please explain the differences in stability class frequency between the two onsite datasets.

PGN RAI ID #: H-0018

PGN Response to NRC RAI:

The comparison of stability distributions for the two data periods as shown in NRC's Attachment 1 illustrates that the two distributions are generally similar and within the variability that one might expect given the length of the data periods and possible differences in the accuracy of the instrumentation used during the two periods. The differences in the distributions are most likely due to the fact that the 1994–1999 onsite data are expected to have less variability than the 1976–1979 onsite data because it is a longer period of record with more observations. In general it is reasonable to expect that, the longer the period of record, the less variability in the results due to averaging effects.

Associated HAR COL Application Revisions:

No COLA revisions have been identified associated with this response.

Associated Attachments/Enclosures:

None.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-6

Text of NRC RAI:

Please discuss the potential for plume trapping or recirculation during accidental and routine releases since the proposed plant will lie in a shallow basin, as shown in FSAR Figures 2.3.2-216 through 2.3.2-219.

PGN RAI ID #: H-0019

PGN Response to NRC RAI:

While the information in Figures 2.3.2-216 through 2.3.2-219 illustrates that the plant is in an area of relatively low ground compared to the surrounding terrain, the scale on these figures may be somewhat misleading since the vertical scale of the figures is exaggerated relative to the horizontal scale. Reconnaissance of the area surrounding the site indicates that within approximately 1 mile of the center of the site the area is generally flat, albeit with some rolling terrain typical of that region of the state. Beyond one mile, the area is also generally flat to gently rolling, and there is a gradual increase in elevation. The terrain elevations within 20 miles of the site are not considered significant enough to cause or to contribute to any noteworthy occurrences of plume trapping or recirculation.

Associated HAR COL Application Revisions:

No COLA revisions have been identified associated with this response.

Associated Attachments/Enclosures:

None.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-7

Text of NRC RAI:

Please include a discussion in FSAR Section 2.3.2.2.1 on the potential impact on atmospheric dispersion when the Main Reservoir is colder than the surrounding land and air.

PGN RAI ID #: H-0020

PGN Response to NRC RAI:

Additional discussion will be included in FSAR Section 2.3.2.2.1 in a future amendment to the document as described below.

Associated HAR COL Application Revisions:

The following paragraph will be inserted after the third paragraph of FSAR Section 2.3.2.2.1 "Topographical Description":

"There may also be periods when the average temperature of the water in the reservoir is colder than the surrounding land and air. It is expected that such periods could occur during or after synoptic changes in weather patterns or air masses that result in the flow of warm air into the region when the reservoir water is still cool. These occurrences are most likely to occur in the spring when synoptic scale air masses from the Gulf of Mexico or the Atlantic move into the area. Under these circumstances there could be some short-term effects on local dispersion due to the presence of a stable layer of air over the reservoir. The most likely effects on dispersion would be a decrease in thermally-induced vertical mixing in the near-surface stable layer over the reservoir. However, these effects are not expected to persist for any significant distance from the reservoir for two reasons: 1) the reservoir consists of a number of smaller reaches that extend in different directions, rather than one large mass of water, and 2) the reservoir is surrounded by vegetative and forested areas with surface roughness features that will generate mechanical turbulence and mixing, which in turn will break up the localized layer of stable air."

Associated Attachments/Enclosures:

None.

NRC Letter No.: HAR-RAI-LTR-001

NRC Letter Date: August 1, 2008

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.02-8

Text of NRC RAI:

FSAR Section 2.3.2.2.2 states that ice formation on structures is not expected to occur if the structure is lower than half the cooling tower height. Please provide a basis for this statement (i.e., an appropriate reference or stated engineering judgment).

PGN RAI ID #: H-0021

PGN Response to NRC RAI:

Additional and revised text will be included in FSAR Section 2.3.2.2.2 "Fogging and Icing Effects Attributable to Cooling Tower Operation" in a future amendment to the document.

Associated HAR COL Application Revisions:

The first two sentences of the fourth paragraph of FSAR Section 2.3.2.2.2 will be revised from:

"Ice formation on structures is not expected to occur if the structure is lower than half the cooling tower height. From a 183-m (600-ft.) cooling tower, and a plume rise that typically will extend at least 305 m (1000 ft.) above the tower in the most stable case, the plume will not ordinarily intersect any structure having a height less than the cooling tower."

To read:

"Ice formation is not expected to occur on structures in the vicinity of the plant, either onsite or offsite. The proposed cooling towers for HAR 2 and HAR 3 will be 183-m (600-ft.) high, and the cooling tower plumes will normally rise at least 305 m (1000 ft.) above the tower in the most stable case. The tallest plant structure at the HAR site (the containment building) will be less than 250 ft. high (refer to DCD Figure 3.7.2-12) and there are no known tall structures in the site vicinity. In general, the cooling tower plumes are not expected to intersect any structures on or in the vicinity of the site."

Associated Attachments/Enclosures:

None.