PMHarrisCOL PEmails

From: Donald Palmrose
Sent: Monday, November 10, 2008 1:11 PM
To: Matthews, Monte K SAW
Cc: Bruce Olson
Subject: PEC letter with supplement cost information
Attachments: PEC ER supplemental internal cost data_ML082800314.pdf

Monte,

The attachment describes how PEC will update the ER with respect to construction costs.

Let me know if you have any questions.

Don

Donald Palmrose, PhD
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From: Donald Palmrose

Created By: Donald.Palmrose@nrc.gov

Recipients:
"Bruce Olson" <Bruce.Olson@nrc.gov>
Tracking Status: None
"Matthews, Monte K SAW" <Monte.K.Matthews@saw02.usace.army.mil>
Tracking Status: None

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Recipients Received:

Progress Energy

James Scarola
Senior Vice President and Chief Nuclear Officer
Progress Energy Carolinas, Inc.

Serial: NPD-NRC-2008-039
October 3, 2008

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

Subject: Shearon Harris Nuclear Power Plant, Units 2 and 3
NRC Docket Number 52-022 and 52-023
HAR COLA ER - Supplemental Internal Cost Data

Ladies and Gentlemen:

Progress Energy – Carolinas (PEC) submitted an application, dated February 18, 2008, for a combined construction permit and operating license (COLA) for two AP1000 advanced pressurized water reactors (Harris Units 2 and 3) to be located at the North Carolina site of the Shearon Harris Nuclear Power Plant Unit 1. Progress Energy – Florida (PEF) submitted an application, dated July 28, 2008, for a COLA for two AP1000 advanced pressurized water reactors (Levy Units 1 and 2) to be located at the Levy Nuclear Plant in Levy County, Florida. In addition, PEF submitted a petition to the Florida Public Service Commission (FPSC) on March 11, 2008 that included a non-binding overnight capital cost estimate for the two proposed Levy Units.

The Environmental Report (ER) for Harris COLA provided an estimate of the internal economic costs of the Harris Units 2 and 3, including an overnight capital cost based on four published studies of overnight capital costs for construction of new nuclear plants. For purposes of estimating economic costs for the public portion of the Harris COLA ER § 10.4.2.2, PEC analyzed those published studies, concluded that they tended to support an overnight capital cost estimate of $2,000 per kW, and multiplied that amount by the projected output of Harris Units 2 and 3 to arrive at an estimate of overnight capital costs of $2.2 billion per unit.

In the filing with the FPSC, PEF stated the estimated overnight capital cost for the two proposed Levy Units is: (a) Unit 1 overnight total cost $5,617,297,000; (b) Unit 2 overnight total cost $3,686,282,000; and (c) the total for both is $9,303,579,000. For the reasons discussed in Enclosure 1, the discussion in Harris COLA ER § 10.4 will be revised to use these estimated overnight capital costs for the two proposed Levy Units as the estimated overnight capital cost for Harris Units 2 and 3.

In Part 1 of the Harris COLA, PEC submitted as proprietary information cost estimates specific to Harris Units 2 and 3 that are based on discussions with the supplier of the AP1000 plant and vendors of associated materials and services. As explained in the affidavit that is attached to PEC's Application,

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public disclosure of that financial information "would allow Progress's contractors, vendors and competitors to understand [Progress's] competitive position and schedule prior to securing the related contracts and services or pricing competitive services."[1] PEC is not revising the proprietary estimate of overnight capital costs for Harris Units 1 and 2 contained in Harris COLA Part 1. That proprietary information shows an estimated overnight capital cost less than the estimate for the two proposed Levy Units primarily because the two proposed Levy Units are located at a greenfield site. As such, PEC considers the cost estimate for the two proposed Levy Units a bounding estimate for Harris Units 2 and 3.

Enclosure 1 details the changes to the information in Harris COLA ER § 10.4 and other supporting changes to be consistent with supporting information filed by PEF with FPSC for the two proposed Levy Units, as described above. Information provided in Enclosure 1 will be incorporated in a future revision to the Harris COLA as noted in Enclosure 1. If you have any 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 October 3, 2008.

Sincerely,

James Scarola

Enclosure
1. Revision to Environmental Report Internal Cost Estimate (Harris COLA ER § 10.4)

cc:
Mr. Manny Comar, U.S. NRC Project Manager
Dr. Donald Palmrose, U.S. NRC Project Manager
U.S. NRC, Office of General Counsel, S. Brock
North Carolina Waste Awareness and Reduction Network, J. Runkle
North Carolina Utility Commission, L. Watson,
South Carolina Office of Regulatory Staff, F. Belser

cc (without Enclosure)
U.S. NRC Director, Office of New Reactors/NRLPO
U.S. NRC Office of Nuclear Reactor Regulation/NRLPO
U. S. NRC Resident Inspector, SHNPP, Unit 1
U.S. NRC Region II, Regional Administrator

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[1] Affidavit of James Scarola (Feb. 18, 2008) at 1 (ADAMS No. ML080580078).

Revision to Environmental Report Internal Cost Estimate

Issue addressed:

Progress Energy – Carolinas (PEC) submitted an application, dated February 18, 2008, for a combined construction permit and operating license (COLA) for two AP1000 advanced pressurized water reactors (Harris Units 2 and 3) to be located at the North Carolina site of the Shearon Harris Nuclear Power Plant Unit 1. Progress Energy – Florida (PEF) submitted a COLA, dated July 28, 2008, for two AP1000 advanced pressurized water reactors (Levy Units 1 and 2) to be located at the Levy Nuclear Plant in Levy County, Florida. The estimated overnight capital cost of $2.2 billion per unit in the Harris COLA Environmental Report (ER) § 10.4.2.2 was based on the best publicly available information at the time. A non-binding estimate of the costs of the two proposed Levy Units, albeit at a greenfield site, were submitted to the Florida Public Service Commission (FPSC) on March 11, 2008, stating that expected overnight capital cost was about $9.3 billion total for both units. This submission addresses the cost estimates in the Harris COLA ER in light of the Levy cost estimates.

Discussion:

1. Overnight Capital Cost Estimate

The $2.2 billion per unit construction cost estimate set forth in Harris COLA ER § 10.4.2.2 was based on four published studies of overnight capital costs for construction of new nuclear plants that were the most authoritative reports publicly available in 2007 on the subject of overnight capital costs for advanced nuclear power plants because of the breadth and depth of their analyses. For purposes of estimating costs for the public portion of its ER, PEC analyzed those published studies, concluded that they tended to support an overnight capital cost estimate of $2000 per kW, and multiplied that amount by the projected output of Harris to arrive at the $2.2 billion per unit estimate.

Because the ER found that no alternative was environmentally preferable to the proposed action, the Harris-specific projected costs is not material to the conclusions in the ER. Commission decisions establish that the environmental analysis first considers environmental considerations. Economic costs of a proposed project should only become part of the NRC's cost-benefit balancing where a finding is made that a reasonable alternative is environmentally preferable to the proposed project. If an alternative is determined to be environmental preferable, economic cost is one of the factors considered in determining whether that alternative is obviously superior to the proposed option. Accordingly, NEPA

> requires [the NRC] to consider whether there are environmentally preferable alternatives to the proposal before us. If there are, we must take the steps we can to see that they are implemented if that can be accomplished at a reasonable cost, i.e., one not out of proportion to the environmental advantages to be gained. But

> if there are no preferable environmental alternatives, such cost-benefit balancing does not take place.[2]

In short, "NEPA requires [the NRC] to look for environmentally preferable alternatives, not cheaper ones."[3]

The NRC has reiterated this point more recently in the slightly different context of an Early Site Permit proceeding. Citing the Midland decision quoted above, the Commission found that "cost would only come into the analytical balancing if the environmental impact balancing indicates that a reasonable alternative is environmentally preferable to the proposed project."[4]

Because the Harris COLA ER shows there are no environmentally preferable alternatives to the proposed action, the amount of the Harris-specific cost estimate is immaterial to the NRC's NEPA analysis or the conclusions in the ER. For example, Section 9.4 discusses alternatives to the proposed cooling water option, heat dissipation method, and transmission alternatives. None of the alternatives are considered environmentally preferable to the proposed action. Therefore, consistent with considering economic cost only to determine if an environmentally preferred alternative is obviously superior, economic cost is not used in the analysis. While economic costs are presented in section 9.4, the purpose is to provide quantified data where feasible consistent with the NRC guidance in the NRC Environmental Standard Review Plan, NUREG-1555, § 10.4.2 at 10.4.2-4.

The estimated cost of the Levy Units is public information on the costs of two AP1000 reactors that is based on discussions with the supplier and associated vendors. The estimated overnight capital cost for the two proposed Levy County Units is: (a) Unit 1 overnight total cost $ 5,617,297,000; (b) Unit 2 overnight total cost $ 3,686,282,000; and (c) the total for both is $ 9,303,579,000. The discussion in HAR COLA ER section 10.4 will be revised to use the overnight capital cost estimate for the two proposed Levy Units.[5]

The estimates for Levy units are considered bounding for the Harris units, because Levy is a greenfield site; requiring additional infrastructure items, such as:

a. The foundation design for the nuclear island is more complex than Harris and hence more expensive.

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[2] Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-458, 7 N.R.C. 155, 162 (1978) (first emphasis in original; second emphasis added); see also Virginia Electric & Power Co. (North Anna Nuclear Power Station, Units 1 and 2), ALAB-584, 11 N.R.C. 451, 458 (1980).

[3] Midland Plant, Units 1 and 2, ALAB-458, 7 N.R.C. at 168.

[4] Exelon Generation Co., LLC (Early Site Permit for the Clinton ESP Site), LBP-05-19, 62 N.R.C. 134, 179, aff'd, CLI-05-29, 62 N.R.C. 801 (2005), aff'd sub nom., Envtl. Law & Policy Ctr. v. N.R.C., 470 F.3d 676 (7th Cir. 2006) (emphasis in original) (footnote omitted).

[5] The NRC environmental review guidance (NUREG-1555) suggests that the cost of alternative cooling and transmission systems in ER Section 9.4 and internal costs in ER Section 10.4 be provided using consistent methods and assumptions. The data in Harris COLA ER § 9.4 were based primarily on discussion with vendors. Therefore, revising the estimated costs provided in Harris COLA ER § 10.4 to be based on the Levy cost estimates which are based on discussions with vendors will provide economic cost data in Harris COLA ER § 10.4 on the same basis as Harris COLA ER § 9.4.

b. Levy is more remote compared to Harris from its water resources (especially for blowdown); therefore, it will take more capital cost to develop the make-up and blowdown lines for Levy compared to Harris. While increasing the lake level at Harris entails some cost, significant cost items are avoided for Harris as the original site work took into account the increased lake level needed to support additional units.

In Part 1 of the Application, PEC submitted as proprietary information Harris-specific cost estimates that are based on discussions with the supplier of the AP1000 plant and vendors of associated materials and services. PEC sought confidential treatment of that information because Progress continues to be involved in commercially-sensitive negotiations with the likely supplier of its nuclear plant. As explained in the affidavit that is attached to the Harris COLA, public disclosure of that financial information "would allow Progress's contractors, vendors and competitors to understand [Progress's] competitive position and schedule prior to securing the related contracts and services or pricing competitive services."[6] This Harris-specific cost estimate is less than the cost estimate for the two proposed Levy Units, confirming the cost estimate for the two proposed Levy Units is bounding for Harris.

2. Specific Changes to Harris COLA ER § 10.4

For the reasons discussed above, the following changes will be made to the Harris COLA ER § 10.4 in a future revision. In addition to the changes described above, other supporting changes will be made to Harris COLA ER § 10.4 to be consistent with supporting information filed by PEF with FPSC for the two proposed Levy Units. The specific changes are as follows:

a. Harris COLA ER § 10.4.1.2 at page 10-66

Current language:

The first sentence of the first paragraph reads: "The following paragraphs provide a summary of the evaluation that was conducted in Section 9.2, to determine a suitable electric generating power source to meet the demand for new power in North Carolina."

Revised language:

To reflect that the section summarizes both the discussion of alternate energy sources in Section 9.2 and the Demand Side Management programs in Section 8.2.2, the first sentence will be revised to read: "The following paragraphs provide a summary of the evaluation that was conducted in Sections 8.2.2 and 9.2, to determine a suitable electric generating power source to meet the demand for new power in North Carolina."

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[6] Affidavit of James Scarola (Feb. 18, 2008) at 1.

b. Harris COLA ER § 10.4.2.1 at page 10-72

(1) Second paragraph

Current language:

The second paragraph currently reads: "Construction costs and operation costs are generally discussed using established cost information developed by several resources. There are many cost studies available in the literature with a wide range of cost estimates. Four studies are believed to be the most authoritative because of the breadth and depth of their analyses. These four studies are as follows:"

Revised language:

For the reasons discussed above, the second paragraph will be revised to read: "Construction costs and operation costs are generally discussed using established cost information developed by several resources. There are many cost studies available in the literature with a wide range of cost estimates. ~~Four studies are believed to be the most authoritative because of the breadth and depth of their analyses~~. Four studies provide adequate breadth and depth of analyses to provide a reasonably accurate and complete baseline of internal capital costs and a rational basis for estimating costs. These four studies are as follows:"

(2) Fourth paragraph

Current language:

The fourth paragraph currently reads: "Using the information contained within the four studies identified above, the internal costs of constructing and operating a new nuclear facility at HAR was developed, meeting the intent of NUREG-1555. The construction and operating cost values accounted for all aspects of pertinent construction and operating practices and methods unique to nuclear generating facilities and were based on industry standards as outlined in the literature cited above."

Revised language:

For the reasons discussed above, the fourth paragraph will be revised to read: "Using the information contained within the four studies identified above, an estimate of the internal costs of constructing and operating a new nuclear facility at HAR was developed~~, meeting the intent of NUREG-1555~~. The construction and operating cost values accounted for all aspects of pertinent construction and operating practices and methods unique to nuclear generating facilities and were based on industry standards as outlined in the literature cited above. In addition, a non-binding project cost estimate for two proposed Levy Units submitted to the Florida Public Service Commission in March 11, 2008 was considered. The proposed Levy Units are the same design (AP1000) and the applicant at Levy has a common ultimate parent with the Applicant. The overnight cost estimate for the two proposed Levy Units is considered as conservative for estimating the costs of constructing and operating new units at HAR because, unlike the Harris site, the Levy site is a greenfield site. For example, there is a greater distance to water resources

at Levy and a more complex foundation design beneath the nuclear island at Levy that would increase capital costs compared to the new facility at HAR."

c. Harris COLA ER § 10.4.2.2 at page 10-73

Current language:

The last paragraph reads: "The four studies identified in Subsection 10.4.2.1 tend to support $2000 per kW as a reasonable high-end overnight capital cost estimate. The $2300 value presented above is based on construction in Japan (Reference 10.4-004). While no explanation is offered as to why this is so high, it is reasonable to suggest that contributing factors are the high cost of living in Japan (labor accounts for more than 20 percent of costs) and difficulties associated with construction on an island. For the purposes of analysis in this ER, to avoid understating the cost, $2000 per kW value was chosen. According to Subsection 3.2.2, it is anticipated that the HAR will each be rated at a Nuclear Steam Supply System (NSSS) power of 3415 MWt, with an associated core power of 3400 MWt and a rated net electrical output of 1000 MWe. Using the capital cost estimate value of $2000 per kW results in a HAR per unit construction cost of approximately $2.2 billion."

Revised language:

For the reasons discussed above, the last paragraph will be revised to read: "The four studies identified in Subsection 10.4.2.1 tend to support $2000 per kW. ~~as~~ The overnight capital costs provided to the Florida Public Service Commission in March 2008 as a non-binding estimate for two AP1000 units proposed for the Levy site was about $9.3 billion total or an average of $4230 per kW. Because the Levy site is a greenfield site, this estimate is a reasonable high-end overnight capital cost estimate. ~~The $2300 value presented above is based on construction in Japan (Reference 10.4-004). While no explanation is offered as to why this is so high, it is reasonable to suggest that contributing factors are the high cost of living in Japan (labor accounts for more than 20 percent of costs) and difficulties associated with construction on an island.~~ For the purposes of analysis in this ER, ~~to avoid understating the cost, $2000~~ $4230 per kW value was chosen. According to Subsection 3.2.2, it is anticipated that the HAR will each be rated at a Nuclear Steam Supply System (NSSS) power of 3415 MWt, with an associated core power of 3400 MWt and a rated net electrical output of 1000 MWe. ~~Using the capital cost estimate value of $2000 per kW results in a HAR per unit construction cost of approximately $2.2 billion.~~ Using the capital cost estimate value of $4230 per kW results in a total overnight capital cost estimate for two HAR units of no more than $9.3 billion.

d. Harris COLA ER Table 10.4-1 (Sheet 7 of 16) at page 10-85

(1) For reasons discussed above, under the heading entitled "Internal Costs" in the row entitled "Construction Cost," the following will be added to the text in each of the first three columns ("Proposed Site HAR Site," "Option 1 Brunswick Site," and "Option 2 H. B. Robinson Site"): "The upper bounding estimate for construction cost is $9.3 billion for two units."

(2) For reasons discussed above, under the heading entitled "Internal Costs" in the row entitled "Construction Cost," the following will be added to the text in the last column ("Option 3

Marion County Site"): "As a greenfield site, anticipated construction cost is approximately $9.3 billion for two units."