R. R. Sgarro
Manager-Nuclear Regulatory Affairs

PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
Tel. 570.802.8102 FAX 570.802.8119
rrsgarro@pplweb.com

September 24, 2009

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

BELL BEND NUCLEAR POWER PLANT
RESPONSE TO RAI No. 44
BNP-2009-259 Docket No. 52-039

References: 1) M. Canova (NRC) to R. Sgarro (PPL Bell Bend, LLC), Bell Bend COLA – Request for Information No. 44 (RAI No. 44) – CHPB-3314, email dated August 10, 2009

The purpose of this letter is to respond to the request for additional information (RAI) identified in the referenced NRC correspondence to PPL Bell Bend, LLC. This RAI addresses Radiation Protection Design Features, as discussed in Section 12.3 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Bell Bend Nuclear Power Plant Combined License Application (COLA).

The enclosure provides our responses to RAI No. 44, Questions 12.03-12.04-1 through 12.03-12.04-4, which include revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes in a future revision of the COLA. This future revision of the COLA is the only new regulatory commitment contained in this submittal.

Should you have questions or need additional information, please contact the undersigned at 570.802.8102.

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

Executed on September 24, 2009

Respectfully,

Rocco R. Sgarro

Enclosure: As stated

D079
NRO

cc: (w/o Enclosures)

Mr. Samuel J. Collins
Regional Administrator
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Mr. Michael Canova
Project Manager
U.S. Nuclear Regulatory Commission
11545 Rockville Pike, Mail Stop T6-E55M
Rockville, MD 20852

Mr. Joseph Colaccino
Branch Chief
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Enclosure 1

Response to NRC Request for Additional Information No. 44
Bell Bend Nuclear Power Plant

RAI 44
Question 12.03-12.04-1

10 CFR 20.1502 requires that licensees monitor exposures from licensed and unlicensed radiation sources under their control.

(1) Confirm whether neutron radiation exposure from the Susquehanna Steam Electric Station, Units 1 and 2 (SSES) independent spent fuel storage installation (ISFSI) was included in the estimated construction worker dose.

(2) Provide information on what the neutron dose to construction workers is due to the SSES ISFSI, as well as how this dose was measured or calculated.

(3) If your conclusion is that the dose is negligible, provide information supporting this conclusion (such as neutron survey results, etc.).

Response

(1) Neutron radiation dose from the ISFSI for SSES 1 and 2 was included in the estimate of construction worker doses.

(2) Ten percent of the total dose to the construction workers was due to the neutron dose from the ISFSI. Ten percent was used as a conservative estimate for the neutron dose since, as shown in the following table, the fraction of neutron dose to gamma dose for ISFSI containers (52B and 61BT) used by SSES ranged from 0% up to 8%.

Gamma dose (mrem/hr)	Neutron dose (mrem/hr)		Ratio of Neutron to Gamma Dose
52B			
0.53	0.004		0.01
20.1	0.589		0.03
1.6	0.0066		0.00
85	0.082		0.00
61BT			
1.04	0.025		0.02
109	8.54		0.08
3.57	0.04		0.01
109	0.6		0.01
		Bounding	0.10

This was incorporated into the dose projections by increasing the TLD measurements by 10%.

(3) Not applicable based on the response to item (2).

COLA Impact

The COLA will not be revised as a result of this response.

BBNPP RAI No. 44
Question 12.03-12.04-2

Section 12.3.1.6 of the DC FSAR application contains conceptual design information that is outside the scope of the U.S. EPR design certification related to the following facilities: access building, personnel decontamination area, portable instrument calibration facility, respiratory facility, equipment decontamination facility, radioactive material storage facility, and facility for dosimetry processing and bioassay.

RG 1.206, Part C.I.1.8, "Site and Plant Design Interfaces and Conceptual Design Information," states that the NRC staff expects COL applicants who reference a certified design to provide complete designs for the entire facility including appropriate site-specific design information to replace the conceptual design portions of the DCD for the referenced certified design.

The applicant incorporated EPR FSAR Section 12.3.1 by reference without addressing the site-specific facilities identified in Section 12.3.1.6. Update section 12.3 of the BBNPP FSAR to include those portions of the conceptual design information described in Section 12.3.1.6 of the EPR FSAR that will be incorporated into the BBNPP Unit 3 site-specific design. Alternatively, provide the site-specific design information which will replace the conceptual design provided in the DCD.

Response

The BBNPP FSAR Section 12.3 will be updated in a future revision of the COLA to incorporate the conceptual design information described in Section 12.3.1.6 of the EPR FSAR.

COLA Impact

BBNPP FSAR Section 12.3.1 will be revised to include the site-specific facilities as shown.

12.3.1 FACILITY DESIGN FEATURES

No departures or supplements.

12.3.1.1 Reactor Building

No departures or supplements.

12.3.1.2 Safeguard Building

No departures or supplements.

12.3.1.3 Fuel Building

No departures or supplements.

12.3.1.4 Nuclear Auxiliary Building

No departures or supplements.

12.3.1.5 Radioactive Waste Processing Building

No departures or supplements.

12.3.1.6 Access Building

The U.S. EPR FSAR includes the following conceptual design information in Section 12.3.1.6 for the Access Building:

Access control facilities control the entrance and exit of personnel and materials into and from the radiologically controlled area (RCA) of the plant. [[Separate change areas for male and female personnel are located at the access control facility. These facilities are located at elevations -13 feet and 0 feet of the Access Building. The change areas are sufficiently sized to support routine operations, maintenance and typical refueling outage conditions.

Radiation protection offices sufficient to support staff oversight of the radiological control program are located at elevation +39 feet of the Access Building. Space is provided for storage and issuance of radiation protection equipment, instrumentation, dosimetry, and supplies.

Access control facilities are shown in Figures 12.3-14-[[Access Building at Elevation -31 Ft Radiation Zones]] through 12.3-20-[[Access Building at Elevation +54 Ft Radiation Zones.]]

Personnel Decontamination Area

[[Once a worker has entered the RCA within the Access Building, entrance to the portions of the connecting buildings in the RCA is at elevation 0 feet, where the worker enters Safeguard Building Division 4. From there, the worker can follow a passageway around the Reactor Building and enter the Fuel Building and Nuclear Auxiliary Building or access other divisions of the Safeguard Building.

Personnel decontamination areas are located near the exit side of the primary access control facility at elevation 0 feet of the Access Building near the control point. The personnel decontamination area is supplied

with sinks and showers with drains that are routed to the liquid waste management system.]]

Portable Instrument Calibration Facility

[[A portable instrument calibration facility is located at elevation 0 feet of the Access Building and is designed so that radiation fields created during calibrations do not unnecessarily expose personnel and do not interfere with low-level monitoring or counting systems. This facility is in a low-background radiation area so that ambient radiation fields from plant operation do not interfere with low-range instrument calibrations.]]

Respiratory Facility

[[A respirator facility is located with the laundry and consumables storage area at elevation 0 feet in the Access Building. Room is provided for respirator inspection, maintenance, repair, storage, inventory, control, and issuance.]]

Equipment Decontamination Facility

[[Decontamination and cleaning of personnel protective equipment, instrumentation, and small items are performed in a facility set up for that specific purpose at elevation 0 feet of the Access Building. The washdown area and sink drains are routed to the liquid waste management system, and positive air flow is maintained into the decontamination facility and exhausted into a monitored building ventilation system. The facility is provided with coated walls and floors to ease cleanup and decontamination.]]

Radioactive Materials Storage Area

[[A radioactive materials storage area is located at elevation 0 feet of the Access Building and provides for secure storage of calibration sources.]]

Facility for Dosimetry Processing and Bioassay

[[A bioassay room is located at elevation 0 feet of the Access Building outside of the radiological controlled area for dosimetry processing and bioassays collection. The facility is sufficiently shielded to maintain low background radiation levels.]]

The above conceptual design information is addressed as follows:

The reference Access Building designs are utilized. The design information as stated in the U.S. EPR FSAR is incorporated by reference.

12.3.1.7 Layout Design features for ALARA

No departures or supplements.

12.3.1.8 Access to Radiologically Restricted Areas

No departures or supplements.

12.3.1.9 Equipment Design Features and Shielding for ALARA

No departures or supplements.

BBNPP RAI No. 44
Question 12.03-12.04-3

There appears to be typographical errors in Section 12.3 of the application as follows:

In Section 12.3.5.1.4, pages 12-9, the first two sentences in the last paragraph are unclear.

Table 12.3-5 shows 1.41E+5 Ci (5.22 E+5) Bq of iodine-131 in gaseous releases in 2006. The numerical values are not equivalent and the Ci release appears excessive for routine operation.

Table 12.3-8 shows 4.10 mrem/yr (0.410) uSv/yr shoreline dose for 2004. The numerical values appear to be reversed.

Update the FSAR to include the revised information or provide justification as to why the information provided is correct.

Response

(1) The first and second sentences of the last paragraph of FSAR Section 12.3.5.1.4, as well as ER Section 4.5.4, are identical. The paragraphs will be revised to remove the superfluous sentence.

(2) In Table 12.3-5, the activity value of 1.41E+05 Curie for Iodine-131 in the 2006 column is a typographical error. The table will be revised to reflect the correct activity value of 1.41E-05 Curie.

(3) In Table 12.3-8, the "Full mrem/yr (μSv/yr) with 8760 hr/yr occupancy" shoreline dose value for 2004 are transposed. The table will be revised to reflect the correct dose value of 0.410 (4.10).

COLA Impact

The BBNPP COLA will be revised as follows in a future revision of the COLA:

(1) The last paragraph of FSAR Section 12.3.5.1.4: Construction Worker Dose Estimate will be revised as follows:

> The probability of a worker in each zone, P_Z, reflects the average construction worker and is based on an approximation of how much time the average worker spends in each zone~~. The probability of a worker in each zone, P_Z, results the average construction worker and is based on a rough idea of how much time the average worker spends in each zone~~, as shown in Table 12.3-13. The spatial distribution of zones on the site is shown (gold letters indicating a zone code in each square) in Figure 12.3-5. There are many locations where construction workers are not expected to perform work activities, so they are not marked in the figure. These squares that are marked are chosen because of planned activities at those locations.

The last paragraph of ER Section 4.5.4: Projected Dose Rates at BBNPP will be revised as follows:

The probability of a worker in each zone, P_Z, reflects the average construction worker and is based on an approximation of how much time the average worker spends in each zone~~. The probability of a worker in each zone, P_z, results the average construction worker and is based on a rough idea of how much time the average worker spends in each zone~~, as shown in Table 4.5-16. The spatial distribution of zones on the site is shown (gold letters indicating a zone code in each square) in Figure 4.5-5. There are many locations where construction workers are not expected to perform work activities, so they are not marked in the figure. These squares that are marked are chosen because of planned activities at those locations.

(2) BBNPP FSAR Table 12.3-5 will be revised as shown:

Table 12.3-5 {Historic Gaseous Releases For 2001 Through 2006}

Nuclide	2006 Ci (Bq)
I 131	1.41~~E+05~~ E-05 (5.22E+05)

(3) BBPNPP FSAR Table 12.3-8 will be revised as shown:

Table 12.3-8 {Historical Shoreline Dose}

Year	LADTAPII mrem/yr (μSv/yr) with 12 hr/yr occupancy}	Worker mrem/yr (μSv/yr) with 2200 hr/yr occupancy}	Full mrem/yr (μSv/yr) with 8760 hr/yr occupancy}
2001	1.95E-03 (1.95E-02)	0.358 (3.58)	1.424 (14.24)
2002	1.71E-03 (1.71E-02)	0.314 (3.14)	1.248 (12.48)
2003	2.22E-03 (2.22E-02)	0.407 (4.07)	1.621 (16.21)
2004	5.61E-04 (5.61E-03)	0.103 (1.03)	0.410 (4.10) ~~4.10 (0.410)~~
2005	4.04E-04 (4.04E-03)	0.074 (0.74)	0.295 (2.95)
2006	1.31E-04 (1.31E-03)	0.024 (0.24)	0.096 (0.96)