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March 17, 2010

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

**BELL BEND NUCLEAR POWER PLANT
RESPONSE TO RAI No. 68
BNP-2010-071 Docket No. 52-039**

Reference: 1) M. Canova (NRC) to R. Sgarro (PPL Bell Bend, LLC), Bell Bend COLA – Request for Information No. 68 (RAI No. 68) with Revision – CTSB - 3551, email dated February 22, 2010

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 Technical Specifications, as discussed in Chapter 16 of the Final Safety Analysis Report (FSAR), as submitted in Part 2, and Technical Specifications, as submitted in Part 4 of the Bell Bend Nuclear Power Plant Combined License Application (COLA).

The enclosure provides our response to RAI No. 68, Questions 16-1, 16-2 and 16-3, which includes revised COLA content. This future revision of the COLA is the only new regulatory commitment.

If you have any 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 March 17, 2010

Respectfully,



Rocco R. Sgarro

RRS/kw

Enclosure: As stated

DO 79
NRD

cc: (w/o Enclosures)

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Enclosure

Response to NRC Request for Additional Information No. 68
Bell Bend Nuclear Power Plant

Question 16-1:

TS 3.7.8, Essential Service Water (ESW) System.

In the BBNPP PTS, action statements for the limiting conditions for operation (LCO) 3.7.8, state that when in Condition C with the Retention Pond water level is not within limits specified in surveillance requirement (SR) 3.7.8.9, or the Retention Pond water temperature is not within limits specified in SR 3.7.8.8, the completion time (CT) for restoring these operating parameters to within specified limits is 72 hours.

Condition C implies that in a design basis accident event, all four ultimate heat sink (UHS) cooling towers may be affected, which could result in a potential loss of the UHS safety function. For a similar condition, the standard technical specifications (STS) for Westinghouse plants (NUREG-1431) suggests a more responsive action (e.g. requiring that the Control Room operators verify that the average temperature for the previous 24-hour is within limits specified in the respective TS LCO with a CT of 1 hour, which is normally applied to an unanalyzed plant condition.

Provide justification for the selected CT of 72 hours in the BBNPP PTS, and revise TS 3.7.8 and its associated TS bases, as appropriate

Response:

The BBNPP Technical Specification Limiting Condition for Operation (LCO) 3.7.8, Essential Service Water (ESW) System, was previously modified and elements relocated within the BBNPP COLA, Part 4, Technical Specifications and Bases. Other elements are included in the U.S. EPR Generic Technical Specifications. The Essential Service Water Emergency Makeup System (ESWEMS) Retention Pond level and temperature requirements are now identified in LCO 3.7.19, ULTIMATE HEAT SINK (UHS), in the BBNPP COLA, Part 4, Revision 2.

Condition C of LCO 3.7.19 allows a Completion Time (CT) of 72 hours for restoration of ESWEMS Retention Pond level or temperature, should Retention Pond level or temperature fall outside specified limits. This does not represent a potential loss of UHS safety function as the safety function of the ESWEMS Retention Pond is not required until 72 hours after a design basis event. The safety function of the UHS water inventory for the first 72 hours after a design basis event is provided by the UHS cooling tower basin level which is specified in the U.S. EPR Generic Technical Specifications, LCO 3.7.19, Ultimate Heat Sink (UHS), and the associated Applicable Safety Analysis.

The BBNPP COLA, Part 4, Technical Specifications and Bases, Bases 3.7.19, ULTIMATE HEAT SINK (UHS) states:

If the ESWEMS Retention Pond level or average temperature is not within limits, action must be taken to restore the ESWEMS Retention Pond average temperature or level, as applicable, within limits within 72 hours. In this condition, there is either an insufficient pond volume to ensure a 27 day emergency makeup source to the ESW cooling tower basin(s) or the average emergency makeup water temperature is not bounded by initial conditions assumed in accident analysis for long term heat removal post-LOCA. The 72 hour Completion Time is based on the requirements to maintain a minimum of 3 days

water inventory in each ESW cooling tower basin in order for the train to be considered OPERABLE, and the low probability of a postulated accident occurring during this time period.

The BBNPP COLA Part 4 will be revised to specify the UHS cooling tower basin, instead of the ESW cooling tower basin, to provide additional clarification concerning the UHS function.

Should the restoration of ESWEMS Retention Pond level or temperature not be completed within the specified Completion Time, LCO 3.7.19, Ultimate Heat Sink (UHS), Condition D in the U.S. EPR Generic Technical Specifications provides direction and timing to place the unit in a MODE in which the governing Technical Specification no longer applies.

COLA Impact:

The BBNPP COLA Part 4 will be revised as follows:

3 BASES 3.7.19 ULTIMATE HEAT SINK (UHS)

Plant Specific Technical Specifications:

C.1

If the ESWEMS Retention Pond level or average temperature is not within limits, action must be taken to restore the ESWEMS Retention Pond average temperature or level, as applicable, within limits within 72 hours. In this condition, there is either an insufficient pond volume to ensure a 27 day emergency makeup source to the ESW UHS cooling tower basin(s) or the average emergency makeup water temperature is not bounded by initial conditions assumed in accident analysis for long term heat removal post-LOCA. The 72 hour Completion Time is based on the requirements to maintain a minimum of 3 days water inventory in each ESW UHS cooling tower basin in order for the train to be considered OPERABLE, and the low probability of a postulated accident occurring during this time period.

Question 16-2:

TS 3.7.8, Essential Service Water (ESW) System.

BBNPP FSAR Subsection 9.2.5.3 states, in part, "the minimum required level of 12 ft., elevation 664 ft [mean sea level] msl, which maintains a volume of approximately 50.3 acre-ft. ... The total inventory loss from the ESWEMS retention pond during the 30 day period under the most limiting meteorological conditions (maximum evaporation conditions) was conservatively calculated to be 46.4 acre-ft. ... This inventory loss consists of the following calculated losses and design allowances: (1) 34.2 acre-ft for cooling tower evaporation; (2) 9.8 acre-ft for loss to an ice cover; (3) 2.4 acre-ft for pond seepage. The total water remaining after 30 days is 3.9 acre-ft. All of the remaining water is usable, which provides a margin greater than 8% of the total volume requirement."

In BBNPP PTS Section 3.7.8, Surveillance Requirement (SR) 3.7.8.9 states "Verify water level of the ESWEMS Retention Pond is \geq 644 feet mean sea level (msl)."

The discussion of SR 3.7.8.9 in the PTS bases B 3.7.8 states, in part, "this SR verifies that adequate long term ESW cooling tower basin makeup (i.e., 27 days) is available. The specified level also ensures that sufficient [please spell out the acronym the first time you use it] net positive suction head (NPSH) is available to operate the ESWEMS pumps during the 27 days after a loss of coolant accident (LOCA)."

It appears that the ESWEMS pump NPSH requirement was not considered in the specified minimum value of 644 feet msl. Also, the value of "664 ft msl" in the FSAR is not consistent with the PTS value of "644 ft msl".

Justify that the BBNPP Essential Service Water Emergency Makeup System (ESWEMS) pump can satisfy the required NPSH during the 27 day period post LOCA. Revise TS 3.7.8 and its associated TS bases, as appropriate.

This information is needed to ensure adequacy and completeness of TS 3.7.8 requirements. The level of details in the TS and TS Bases should be comparable to those provided in the STS. At the same time TS requirements and the supporting information in the TS Bases should be consistent with relevant information provided in the FSAR

Response:

The BBNPP Technical Specification Limiting Condition for Operation (LCO) 3.7.8, Essential Service Water (ESW) System, was previously modified and elements relocated within the BBNPP COLA, Part 4, Technical Specifications and Bases. Other elements are included in the U.S. EPR Generic Technical Specifications. The ESWEMS Retention Pond level and temperature requirements are now identified in LCO 3.7.19, ULTIMATE HEAT SINK (UHS), in the BBNPP COLA, Part 4, Revision 2.

Surveillance Requirement (SR) 3.7.8.9 was also relocated. SR 3.7.8.9 is designated SR 3.7.19.5 in BBNPP Technical Specification LCO 3.7.19, ULTIMATE HEAT SINK (UHS). The BBNPP COLA will be revised to renumber existing SR 3.7.19.4 and 3.7.19.5 as SR 3.7.19.6 and 3.7.19.7, respectively.

The current SR 3.7.19.5 (future SR 3.7.19.7) minimum water level was previously revised to be greater than or equal to 664 feet mean sea level (msl) and is consistent with the FSAR 9.2.5 text.

The calculated NPSH available for the EWSEMS pumps does not require any level in the ESWEMS Retention Pond above the suction of the pump, because the ESWEMS Retention Pond Sizing Calculation (Black & Veatch Calculation 161642.51.2001) determined that atmospheric pressure alone provides adequate NPSH (no water level assumed at the pump inlet for NPSH considerations). The ESWEMS Retention Pond Sizing Calculation (ML091831127) was previously submitted by PPL Bell Bend, LLC letter BNP-2009-123, dated June 17, 2009 (ML091831126).

The BBNPP COLA will be revised to delete the statement regarding NPSH for the ESWEMS pumps in the Bases 3.7.19, ULTIMATE HEAT SINK (UHS), SR 3.7.19.5 (future SR 3.7.19.7) discussion.

The BBNPP COLA Part 4 will be revised to specify the UHS cooling tower basin, instead of the ESW cooling tower basin, to provide additional clarification concerning the UHS function.

COLA Impact:

The BBNPP COLA will be revised as follows:

SITE SPECIFIC CHANGES

1 LCO 3.7.19 ULTIMATE HEAT SINK (UHS)

Plant Specific Technical Specifications:

SURVEILLANCE	FREQUENCY
SR 3.7.19.4 <u>6</u> Verify average water temperature of the ESW Emergency Makeup System Retention Pond is $\leq 95^{\circ}\text{F}$.	24 hours
SR 3.7.19. <u>57</u> Verify water level of the ESW Emergency Makeup System Retention Pond is ≥ 664 feet mean sea level (msl).	24 hours

3 BASES 3.7.19 ULTIMATE HEAT SINK (UHS)

Plant Specific Technical Specifications:

SR 3.7.19.46

This SR verifies that the ESW System is available to cool the CCW System and EDG heat exchangers to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a postulated accident. With the average ESWEMS Retention Pond temperature less than or equal to 95°F, the design basis assumption associated with initial ESW temperature is bounded and long term cooling capability of the Emergency Core Cooling System (ECCS) loads and EDGs is assured. The 24 hour Frequency is based on operating experience related to trending of the parameter variation during the applicable MODES.

SR 3.7.19.57

This SR verifies that adequate long term ESW UHS cooling tower basin makeup (i.e., 27 days) is available. ~~The specified level also ensures that sufficient NPSH is available to operate the ESWEMS pumps during the 27 days post-LOCA.~~ The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the ESWEMS Retention Pond elevation is greater than or equal to 664 feet msl, which ensures the necessary pond volume is available to support 30 days of ~~ESW system~~ UHS operation.

Question 16-3:

TS 3.7.8, Essential Service Water (ESW) System.

BBNPP FSAR Subsection 9.2.5.3 describes site-specific ESWEMS equipment which includes transfer pumps, ESWEMS recirculation motor operated valves (MOVs), ESWEMS isolation MOVs, blowdown system isolation valves, and others that automatically respond to an accident signal. The transfer pump operability is verified in Surveillance Requirement (SR) 3.7.8.7 but no SR was provided for the transfer pump valves.

Justify not including a SR for testing of various ESWEMS motor operated valves (MOVs) and control valves to verify their operability in TS 3.7.8. Revise TS 3.7.8 and its associated TS bases, as appropriate.

This justification is needed to ensure adequacy and completeness of TS 3.7.8 requirements

Response:

The BBNPP Technical Specification Limiting Condition for Operation (LCO) 3.7.8, Essential Service Water (ESW) System, was previously modified and elements relocated within the BBNPP COLA, Part 4, Technical Specifications and Bases. Other elements are included in the U.S. EPR Generic Technical Specifications. The ESWEMS and Retention Pond surveillance requirements are now identified in LCO 3.7.19, ULTIMATE HEAT SINK (UHS), in the BBNPP COLA, Part 4, Revision 2.

Surveillance Requirement (SR) 3.7.8.7 is re-designated as SR 3.7.19.5 in the U.S. EPR Generic Technical Specifications B 3.7.19, Ultimate Heat Sink (UHS), SURVEILLANCE REQUIREMENTS.

The ESWEMS isolation, blow down system isolation and normal makeup motor-operated valves are components in the AREVA certified design and are outside the scope of the BBNPP COLA. Testing of these components is addressed in the U.S. EPR Generic Technical Specifications SURVEILLANCE REQUIREMENT SR 3.7.8.2.

Four additional surveillance requirements will be added to the BBNPP Technical Specifications for the ESWEMS components to ensure that valve alignment is verified, automatic valves properly actuate upon signal receipt, strainer operation is verified and that the ESWEMS pump suction inlet is not restricted. Technical Specification text will also be revised to discuss the new surveillance requirements and add component discussion, where needed.

In order to clarify the UHS function from the normal ESW function, additional text changes will be made to the BBNPP Technical Specification LCO 3.7.19 text to specify UHS vice ESW, where appropriate.

Additionally, Seismic Category 1 will be changed to Seismic Category I in the text, where appropriate, and a change is made to correct an LCO number.

COLA Impact:

The BBNPP COLA, Part 4, will be revised as follows:

SITE SPECIFIC CHANGES

1 LCO 3.7.19 ULTIMATE HEAT SINK (UHS)

Plant Specific Technical Specifications:

Bell Bend Nuclear Power Plant has added a Required Action and ~~two~~ six Surveillance Requirements for the ESW Emergency Makeup System (ESWEMS) and Retention Pond.

The previous Condition C has been renumbered to Condition D. In addition, ~~two~~ six new Surveillance Requirements have been added.

SURVEILLANCE	FREQUENCY
SR 3.7.19.4 6 <u>6</u> Verify average water temperature of the ESW Emergency Makeup System Retention Pond is $\leq 95^{\circ}\text{F}$.	24 hours
SR 3.7.19.5 7 <u>7</u> Verify water level of the ESW Emergency Makeup System Retention Pond is ≥ 664 feet mean sea level (msl).	24 hours
<u>SR 3.7.19.8</u> <u>Verify each ESWEMS manual, power operated, and automatic valve in the flow path servicing safety-related equipment that is not locked, sealed, or otherwise secured in position, is in the correct position.</u>	<u>31 days</u>
<u>SR 3.7.19.9</u> <u>Verify each automatic valve in the ESWEMS flow path that is not locked, sealed or otherwise secured, actuates to the correct position on an actual or simulated actuation signal.</u>	<u>24 months</u>
<u>SR 3.7.19.10</u> <u>Verify operation of ESWEMS self cleaning strainers on an actual or simulated actuation signal.</u>	<u>24 months</u>

SR 3.7.19.11	<u>Verify, by visual inspection, each ESWEMS train pump suction inlet from the retention pond is not restricted by debris and/or excessive silt.</u>	<u>24 months</u>
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Justification:

The additional Condition, Required Action, and Surveillance Requirements regarding the ESWEMS valve position, automatic valve operation, strainer operation, pump suction flow path and Retention Pond water level and average water temperature are necessary to ensure that the ESWEMS and Retention Pond remains OPERABLE.

3 BASES 3.7.19 ULTIMATE HEAT SINK (UHS)

Plant Specific Technical Specifications:

The Seismic Category 4| emergency makeup water source to the ~~ESW System (ESWS)~~ UHS cooling tower basin, necessary to support 30 days of post accident mitigation is provided by the safety-related Essential Service Water Emergency Makeup System (ESWEMS) that draws water from the ESWEMS Retention Pond. Water is drawn from the ESWEMS Retention Pond by four independent ESWEMS pumps, one for each ESW division. Each ESWEMS pump has its own suction supply from the ESWEMS Retention Pond; there is no shared suction line for any of the ESWEMS pumps. Each ESWEMS train has one pump, a discharge check valve, a strainer, a pump discharge manual isolation valve, and recirculation valves all housed in the ESWEMS Pumphouse. In each ESW Building, a motor operated valve is provided to allow makeup to the associated ~~ESW~~ UHS cooling tower basin. Each ESWEMS pump is rated at 400 gpm.

...with capability for makeup from an OPERABLE source. An OPERABLE emergency makeup water source consists of one OPERABLE train of the ESWEMS capable of providing makeup water to its associated ~~ESW~~ UHS cooling tower basin. Each ESWEMS train includes a pump, valves, piping, instruments and controls to ensure the transfer of the required supply of water from the ESWEMS Retention Pond to its associated ~~ESW~~ UHS cooling tower.

As described previously, a new Condition and Required Action was created for LCO 3.7.919. A discussion of the Required Action is added to the Action section of the Bases:

C.1

If the ESWEMS Retention Pond level or average temperature is not within limits, action must be taken to restore the ESWEMS Retention Pond average temperature or level, as applicable, within limits within 72 hours. In this condition, there is either an insufficient

pond volume to ensure a 27 day emergency makeup source to the ESW UHS cooling tower basin(s) or the average emergency makeup water temperature is not bounded by initial conditions assumed in accident analysis for long term heat removal post-LOCA. The 72 hour Completion Time is based on the requirements to maintain a minimum of 3 days water inventory in each ESW UHS cooling tower basin in order for the train to be considered OPERABLE, and the low probability of a postulated accident occurring during this time period.

A discussion of the ~~two~~ six new surveillances is added at the end of the Surveillance Requirements section. ~~New SR 3.7.19.4 and SR 3.7.19.5~~ The new Surveillance Requirements are provided below:

SR 3.7.19.4-6

This SR verifies that the ESW System is available to cool the CCW System and EDG heat exchangers to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a postulated accident. With the average ESWEMS Retention Pond temperature less than or equal to 95°F, the design basis assumption associated with initial ESW temperature is bounded and long term cooling capability of the Emergency Core Cooling System (ECCS) loads and EDGs is assured. The 24 hour Frequency is based on operating experience related to trending of the parameter variation during the applicable MODES.

SR 3.7.19.57

This SR verifies that adequate long term ESW UHS cooling tower basin makeup (i.e., 27 days) is available. ~~The specified level also ensures that sufficient NPSH is available to operate the ESWEMS pumps during the 27 days post-LOCA.~~ The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the ESWEMS Retention Pond elevation is greater than or equal to 664 feet msl, which ensures the necessary pond volume is available to support 30 days of ESW system UHS operation.

SR 3.7.19.8

Verifying the correct alignment for manual, power operated, and automatic valves in the ESWEMS flow path provides assurance that the proper flow paths exist for ESWEMS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mis-positioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.19.9

This SR verifies proper automatic operation of the ESWEMS valves on an actual or simulated actuation signal. The ESWEMS System is not a normally operating system and cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.19.10

This SR verifies proper automatic operation of the ESWEMS self cleaning strainer on an actual or simulated actuation signal. The ESWEMS System is not a normally operating system and cannot be fully actuated as part of normal testing.

The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

SR 3.7.19.11

This SR verifies that excess debris and silt have not built up to a level that can affect the operability of the ESWEMS pump. The flow velocity through the ESWEMS intake is less than one foot per minute at rated flow. The low flow condition minimizes the accumulation of silt and debris at the intake.

The 24 month is based on the ESWEMS system normally being in standby and the low flow velocity when the system is operated for surveillance testing.

Justification:

The site specific information provided is consistent with the Bell Bend Nuclear Power Plant FSAR Section 9.2 description of Seismic Category 4| ~~ESW System~~ UHS makeup source. }