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

August 25, 2009

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

BELL BEND NUCLEAR POWER PLANT
RESPONSE TO RAI SET 38
BNP-2009-236 Docket No. 52-039

References: 1) M. Canova (NRC) to R. Sgarro (PPL Bell Bend, LLC), Bell Bend COLA – Request for Information No. 38 (RAI No. 38) – EP - 3299, email dated July 27, 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 the development of Emergency Action Levels (EALs), as discussed in Part 5, Section 3 of the Bell Bend Nuclear Power Plant Combined License Application (COLA), Revision 1.

Attachment 1 to the Enclosure of this letter provides U.S. EPR Design Specific Emergency Action Levels (EALs). Attachment 2 to the Enclosure of this letter identifies revisions to the Emergency Response Plan Annex and the Emergency Action Levels Enclosures A, B and C. Attachment 3 to the Enclosure of this letter identifies revisions for COLA Part 10, Appendix A, Item 8. The COLA modifications identified in Attachment 2 and 3 will be incorporated in a future revision. A Licensing Basis Document Change Request has been initiated to incorporate these changes. This future revision of the COLA is the only new regulatory commitment.

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 August 25, 2009

Respectfully,

Rocco R. Sgarro

RRS/kw

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

Response to NRC Request for Additional Information RAI No. 38, Question 13.03-1
Bell Bend Nuclear Power Plant

RAI No. 38

Question 13.03-1

Basis: 10 CFR 52.79(a)(21), 10 CFR 50.47(b)(4), Section IV.B of Appendix E to 10 CFR Part 50

EALs are discussed in Section D, "Emergency Classification System," of the application, Part 5.

Initial EALs, which are required by 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50, must be approved by the NRC. The PPL Bell Bend, LLC combined license (COL) does not fully address certain aspects of the required EAL scheme. This is because various equipment set points and other information cannot be determined until the as-built information is available; e.g., head corrections, radiation shine, final technical specifications, and equipment calculations and tolerances. The NRC has been evaluating possible options to ensure applicants address the regulations. The NRC is presenting the applicant with two options to satisfy its EAL obligations:

Option 1 – Submit an entire EAL scheme, which contains all site-specific information, including set points. Until this information is finalized, EALs would remain an open item.

Option 2 – Submit emergency plan Section D, "Emergency Classification System," which addresses the four critical elements of an EAL scheme (listed below). The NRC will determine the acceptability of the EAL scheme.

- Critical Element 1 – Applicant proposes an overview of its emergency action level scheme including defining the four emergency classification levels, (i.e., Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency), as stated in NEI 99-01, Revision 5, with a general list of licensee actions at each emergency classification level.

- Critical Element 2 – Applicant proposes to develop the remainder of its EAL scheme by using a specified NRC endorsed guidance document. In the development of its EALs, the proposed EALs should be developed with few or no deviations or differences from NRC guidance, other than those attributable to the specific reactor design. NEI 07-01, if endorsed, will be applicable to the AP1000 and ESBWR (passive) reactor designs, and NEI 99-01 is applicable to all (non-passive) reactor designs. If applicable, EALs related to digital instrumentation and control must be included. The NRC must find in the Safety Evaluation Report that this approach is acceptable for each site.

- Critical Element 3 – Applicant proposes a License Condition (LC) that the applicant will create a fully developed set of EALs in accordance with the specified guidance document. These fully developed EALs must be submitted to the NRC for confirmation at least 180 days prior to fuel load.

- Critical Element 4 – The EALs must be kept in a document controlled by 10 CFR 50.54(q), such as the emergency plan; or a lower tier document, such as the Emergency Plan Implementing Procedures.

Please review the two options provided above, identify which option will be chosen, and provide the detailed EAL information in support of the chosen option.

Response

As identified in RAI No. 38, certain parameter values for the Bell Bend Nuclear Power Plant EALs required by 10 CFR 50.47(b)(4) and App. E.IV.B of 10 CFR Part 50 cannot be determined at this time. Specifically, several EAL thresholds cannot be derived until related as-built plant design information and Technical Specification set points are finalized.

As such, PPL Bell Bend, LLC will withdraw the submitted COLA Part 5 content related to Emergency Action Level (EAL) Enclosures A, B and C and use Option 2. Proposed changes to COLA Part 5 and Part 10 are included in Attachments 2 and 3 of this Enclosure.

PPL Bell Bend, LLC's approach to each of the Critical Elements discussed in the NRC's Request for Additional Information is described below:

Critical Element 1 – The Bell Bend Emergency Plan Part II Section D, Criterion 1, Emergency Classification System contains the following information that meets the requirements of Critical Element 1:

a. Unusual Event - Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No release of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

   This is the least severe of the four (4) levels. The purpose of this classification is to bring response personnel and offsite agencies to a [state] of readiness in the event the situation degrades and to provide systematic handling of information and decision making. The Shift Supervisor, as Interim Emergency Director will classify an Unusual Event.

   Required actions at this classification include:

   - Notifications to site management.
   - Notification, within 15 minutes, of the Commonwealth and local communities.
   - At the discretion of the Emergency Director or site management, full or selective staffing of the TSC, OSC and EOF may be initiated.

- Notification of the Nuclear Regulatory Commission (NRC) as soon as possible but within 60 minutes of classification.

- Assessment of the situation and response as necessary, which may include escalating to a higher classification if conditions warrant.

- When the event is terminated, close-out is performed over communication links to offsite authorities participating in the response (i.e., NRC, Commonwealth, local), followed by formal transmission of a Commonwealth/local notification form within 24 hours.

b. Alert - Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of EPA Protective Action Guideline exposure levels.

The purpose of this classification is to ensure that emergency response personnel are readily available and to provide offsite authorities with current status information. An Alert will be classified as the initiating event or as escalation from an Unusual Event. In either case, the classification will most likely made by the Shift Supervisor (Interim Emergency Director) prior to the transfer of Command and Control.

Required actions at this classification include:

- Notifications to site management.

- Notification, within 15 minutes, of the Commonwealth and local communities. The EOF will assume Commonwealth update responsibilities.

- Activation of the TSC, OSC and the EOF. The JIC organization may be activated at the Alert level.

- Transfer of Command and Control.

- Notification of the NRC as soon as possible but within 60 minutes of classification.

- Notification of INPO and ANI.

- Assessment of the situation and response as necessary, which may include escalating to a higher classification if conditions warrant.

- On-site and off-site Monitoring Teams are sent to staging areas or dispatched to monitor for releases of radiation to the environment.

- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological and radiological data.

- When the event is terminated, notification is performed over communication links followed by an Initial Incident Report to offsite authorities participating in the response (i.e., NRC, Commonwealth, local) within 8 hours.

c. Site Area Emergency - Events are in progress or have occurred which involve an actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

The purpose of this classification, in addition to those of the Alert level, is to ensure that all emergency response centers are manned and provisions are made for information updates to the public through offsite authorities and the news media. The classification will most likely be made by the Emergency Plant Manager following activation of the TSC.

Required actions at this classification, in addition to those listed under the Alert level, include:

- Activation of the JIC.
- If not previously performed, Assembly/Accountability shall be performed and Site Evacuation of non-essential personnel shall be initiated.
- Keeping offsite authorities informed of plant status by providing periodic updates to include meteorological data and projected or actual doses for any releases that have occurred.

d. General Emergency - Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

The purpose of this classification, in addition to those of the Site Area Emergency level, is to initiate predetermined protective actions for the public and provide continuous assessment of information from monitoring groups. The classification will most likely be made by the Emergency Plant Manager following activation of the TSC.

Required actions at this classification, in addition to those listed under the Alert and Site Area Emergency, include:

- A Protective Action Recommendation will be determined.

- Assessment of the situation and response as necessary.

Critical Element 2 – PPL Bell Bend, LLC will develop its EAL scheme using NEI 99-01 Revision 5. The submitted EALs will be written with the following deviations; (1) digital I&C and (2) automatic containment depressurization setpoint.

- NEI 99-01 Revision 5 EALs (SU3, SA4 and SS6), loss of safety system annunciation / indication are not applicable to the U.S. EPR plant design and are therefore deleted.

- New loss of digital I&C EALs have been developed by AREVA for the U.S. EPR consistent with the proposed NEI 07-01 Revision 0 digital I&C EALs for passive reactor designs.

- NEI 99-01 Revision 5 PWR containment potential loss of fission product barrier 2.C is not applicable to the U.S. EPR plant design and is therefore deleted.

The U.S. EPR design specific EAL deviations and their justification are provided in Attachment 1 of this Enclosure.

Critical Element 3 – Part 10 of the current Bell Bend application states:

8. EMERGENCY ACTION LEVELS:

   The BBNPP Emergency Action Levels (EALs) and the associated Technical Bases Manual contains bracketed values requiring plant specific values to be provided that cannot be determined until after the COL is issued. These bracketed values are associated with certain site specific values and detailed design information, such as setpoints and instrument numbers. In most cases, this information is necessary to determine EAL thresholds.

   PROPOSED LICENSE CONDITION:

   PPL Bell Bend, LLC shall submit the plant specific values to the NRC for approval in order to address the remaining bracketed values in the BBNPP EALs and associated Technical Bases Manual as identified below. These plant specific values shall be submitted to the NRC within 2 years of scheduled date for initial fuel load.

The above Proposed License Condition will be revised as follows:

PPL Bell Bend, LLC shall submit a complete set of plant-specific Emergency Action Levels (EALs) for BBNPP in accordance with NEI 99-01 Revision 5 to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations other than those attributable to specific U.S. EPR reactor design considerations.

Critical Element 4 – The EALs will be maintained in a lower tier document, the Bell Bend U.S. EPR EAL Technical Bases Manual, which will be subject to the requirements of 10 CFR 50.54(q). The Bell Bend Emergency Plan Annex Section 3.3, Maintenance of the Emergency Action Levels, states the following:

The EALs are documented in an Emergency Action Level Technical Basis Document. Revision of the EAL Technical Basis Document is controlled the same way as the BBNPP Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

COLA Impact

The Bell Bend Nuclear Power Plant COLA will be updated to incorporate the response to this RAI question. Specifically, these revisions are shown in Attachment 2 and Attachment 3 of the Enclosure to this letter.

Attachment 2 to the Enclosure of this letter identifies the COLA Part 5 revisions for; 1) Emergency Response Plan Annex and 2) Emergency Action Levels Enclosures A, B and C. Attachment 3 to the Enclosure of this letter identifies revisions for Item 8 in COLA Part 10, Appendix A. These modifications identified in Attachment 2 and 3 will be incorporated in a future COLA revision.

Attachment 1

U.S. EPR Design Specific
Emergency Action Levels (EALs)

SA4

Initiating Condition - ALERT

UNPLANNED partial loss of indicating, monitoring and control functions for 15 minutes or longer.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Example Emergency Action Level:

Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.

1. UNPLANNED loss of **PICS** indicating, monitoring and control functions for **15 minutes** or longer.

   OR

2. UNPLANNED loss of **SICS** indicating, monitoring and control functions for **15 minutes** or longer.

Basis:

This IC recognizes the difficulty associated with monitoring changing plant conditions without the use of a major portion of the indication and control systems.

This IC recognizes the challenge to the control room staff to monitor and control the plant due to partial loss of normal and safety indication and monitoring systems. An Alert is considered appropriate if the control room staff requires additional personnel to assist in monitoring alternative indications, manipulate equipment and restore the systems to full capability.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

[The Process Information and Control System (PICS) is a non-safety related, augmented quality digital I&C system. It provides a screen based interface for the operators in the control room and in the remote shutdown station to control and monitor all plant parameters by interfacing with the plant automation systems. The Safety Information and Control System (SICS) is a safety related I&C system which contains both safety and non-safety related equipment. It provides the Human-System Interface (HSI) to perform control and information functions needed to monitor the plant's safety status and bring the unit to and maintain it in a safe shutdown state in case of unavailability of the PICS.

The SICS provides controls for actuating manual reactor trips and manual system level functions performed by the Protection System (PS) and the Safety Automation System (SAS) via the Priority Actuation and Control System (PACS) in order to bring the plant to and maintain it in a cold shutdown state.

Either PICS or SICS is separately capable of bringing the reactor to a safe shutdown. Therefore, a partial loss of the indicating, monitoring, and control functions when the plant has experienced the complete loss of one of the two capable systems (PICS or SICS) and a total loss of the indicating, monitoring, and control functions (i.e. inability to monitor and control the plant from the MCR) is characterized by the complete loss of both capable systems (PICS and SICS).

Loss of the PICS system is indicated by no PICS terminal in the control room being functional. Loss of the SICS system is indicated by no SICS terminal in the control room being functional.]

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor and control the plant.

SS6

Initiating Condition - SITE AREA EMERGENCY

Inability to monitor and control the plant for 15 minutes or longer.

Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown

Example Emergency Action Level:

Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.

1. a. Loss of **PICS** for **15 minutes** or longer.

   AND

   b. Loss of **SICS** for **15 minutes** or longer.

Basis:

This IC recognizes the inability of the control room staff to monitor and control the plant due to loss of normal and safety indication and monitoring systems, and diverse indication and control systems that allow the operators to monitor and safely shutdown the plant.

A Site Area Emergency is considered to exist if the control room staff cannot monitor and control safety functions needed for protection of the public.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

[The Process Information and Control System (PICS) is a non-safety related, augmented quality digital I&C system. It provides a screen based interface for the operators in the control room and in the remote shutdown station to control and monitor all plant parameters by interfacing with the plant automation systems. The Safety Information and Control System (SICS) is a safety related I&C system which contains both safety and non-safety related equipment. It provides the Human-System Interface (HSI) to perform control and information functions needed to monitor the plant's safety status and bring the unit to and maintain it in a safe shutdown state in case of unavailability of the PICS.

The SICS provides controls for actuating manual reactor trips and manual system level functions performed by the Protection System (PS) and the Safety Automation System (SAS) via the Priority Actuation and Control System (PACS) in order to bring the plant to and maintain it in a cold shutdown state.

Either PICS or SICS is separately capable of bringing the reactor to a safe shutdown. Therefore, a partial loss of the indicating, monitoring, and control functions when the plant has experienced the complete loss of one of the two capable systems (PICS or SICS) and a total loss of the indicating, monitoring, and control functions (i.e. inability to monitor and control the plant from the MCR) is characterized by the complete loss of both capable systems (PICS and SICS).

Loss of the PICS system is indicated by no PICS terminal in the control room being functional. Loss of the SICS system is indicated by no SICS terminal in the control room being functional.]

CONTAINMENT BARRIER THRESHOLDS: (1 or 2 or 3 or 4 or 5 or 6 or 7 or 8)

2. Containment Pressure

Potential Loss Threshold C

The U.S. EPR containment volume, condensation surface area, and heat capacities are such that the containment design pressure is not exceeded during design basis Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) events.

In addition, the containment pressure decreases to less than 50% of the accident analysis values in less than 24 hours thus ensuring that radiological dose consequences are acceptable.

Mass and energy releases to the containment during LOCA and MSLB events were calculated using the NRC approved RELAP5/MOD2 (B&W) methodology. Containment pressure responses were calculated using the NRC approved GOTHIC code methodology.

An automatically actuated containment spray system is therefore not required to mitigate the consequences of a Design Basis Accident for the U.S. EPR; therefore, there is no automatic actuation setpoint for this potential loss fission product barrier threshold to be based upon.

Attachment 2

Proposed Revisions to Sections in COLA Part 5 Emergency Response Plan Annex and Emergency Action Levels Enclosure A, B and C

Section 3: Classification of Emergencies

Section D of the {BBNPP} Emergency Plan describes the classification of emergencies into four levels of Emergency Class. They are the UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY, and GENERAL EMERGENCY. These classification levels are entered by meeting the criteria of Emergency Action Levels (EALs) provided in this section of the U.S. EPR Annex.

3.1 Emergency Action Levels (EALs)

An Emergency Action Level scheme based on Revision 5 of NEI 99-01, "Methodology for Development of Emergency Action Levels," currently ~~under review by the Nuclear Regulatory Commission~~ approved for use by NRC letter from Christopher G. Miller to NEI dated 02/22/08~~, or the most current NRC endorsed version available at the time of EAL submittal,~~ is used for {BBNPP}. ~~Specific items not applicable to the U.S. EPR design are identified and alternate initiating conditions used as appropriate. Table 3-1, Emergency Action Level Initiating Conditions, provides a list of conditions considered for classification.~~ The submittal EALs will be written with no deviations other than those attributable to specific U.S. EPR reactor design considerations.

~~Emergency Action Level Threshold Values for each of the Initiating Conditions are provided in an EAL Technical Basis Document with appropriate basis and references.~~

~~An emergency is classified by assessing plant conditions and comparing abnormal conditions to Initiating Conditions and Threshold Values for each Emergency Action Level. Individuals responsible for the classification of events will refer to the Initiating Condition and Threshold Values in an Emergency Plan Implementing Procedure (EPIP). This EPIP contains Initiating Conditions, EAL Threshold Values, Mode Applicability Designators, appropriate EAL numbering system, and additional guidance necessary to classify events.~~

~~The EALs are set up in Recognition Categories. The first relates to Abnormal Radiological Conditions / Abnormal Radiological Effluent Releases. The second relates to Fission Product Barrier Degradation. The third relates to Hot Condition System Malfunctions. The fourth relates to Hazards and Other Conditions. The fifth related to Cold Shutdown System Malfunctions.~~

~~Emergency Action Levels are the measurable, observable detailed conditions that must be met in order to classify the event. Classification is not to be made without referencing, comparing and satisfying the Threshold Values specified in the Emergency Action Levels.~~

~~Mode Applicability provides the unit conditions when the Emergency Action Levels represent a threat. The Basis contains explanations and justification for including the Initiating Condition and Emergency Action Level.~~

~~A list of definitions is provided as part of this document for terms having specific meaning to the Emergency Action Levels. Site specific definitions are provided for terms with the intent to be used for a particular Initiating Condition/Threshold Value and may not be applicable to other uses of that term at other sites, the Emergency Plan or procedures.~~

~~An EAL Technical Basis Document provides references to documents which were used to develop the EAL Threshold Values.~~

~~References to the {Emergency Director} means the person in Command and Control as defined in the Emergency Plan. Classification of emergencies is a non-delegable responsibility of the {Emergency Director}.~~

~~Classifications are based on evaluation of the U.S. EPR Unit condition. All classifications are to be based upon VALID indications, reports or conditions. Indications, reports or conditions are considered VALID when they are verified by (1) an instrument channel check, or (2) indications on related or redundant indications, or (3) by direct observation by plant personnel, such that doubt related to the indication's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.~~

~~EALs are for unplanned events. A planned evolution involves preplanning to address the limitations imposed by the condition, the performance of required surveillance testing, and the implementation of specific controls prior to knowingly entering the condition. Planned evolutions to test, manipulate, repair, perform maintenance or modifications to systems and equipment that result in an EAL Threshold Value being met or exceeded are not subject to classification and activation requirements as long as the evolution proceeds as planned. However, these conditions may be subject to the reporting requirements of 10 CFR 50.72 and/or 10 CFR 50.73.~~

~~When two or more Emergency Action Levels are determined, declaration will be made on the highest classification level for the unit. {When all station units are affected, the highest classification for the Station will be used for notification purposes and specific units' classification levels will be noted}.~~

~~3.2. Emergency Action Levels Categories~~

~~The EAL Scheme is broken into the following five major categories and numerous sub-categories as appropriate. Each major initiating condition described in Table 3-1, Emergency Action Level Initiating Conditions may be broken into additional sub conditions based on actual threshold values.~~

~~A. Category F – Fission Product Barriers~~

~~EALs in this category represent threats to the defense in depth design concept that precludes the release of highly radioactive fission products to the environment. This concept relies on multiple physical barriers any one of which, if maintained intact, precludes the release of significant amounts of radioactive fission products to the environment. The primary fission product barriers are:~~

1. ~~Reactor Fuel Clad (FC): The zirconium tubes which house the ceramic uranium oxide pellets along with the end plugs which are welded into each end of the fuel rods comprise the Fuel Clad.~~
2. ~~Reactor Coolant System (RC): The Reactor Vessel shell, vessel head, vessel nozzles and penetrations and all primary systems directly connected to the Reactor Vessel up to the first Containment isolation valve comprise the RCS.~~

3. ~~Containment (CT): The vapor Containment structure and all isolation valves required to maintain Containment integrity under accident conditions comprise the Containment barrier.~~

~~The EALs in this category require evaluation of the Loss and Potential Loss thresholds listed in the fission product barrier matrix of Table 3-1. "Loss" and "Potential Loss" signify the relative damage and threat of damage to the barrier. "Loss" means the barrier no longer assures containment of radioactive materials. "Potential Loss" means integrity of the barrier is threatened and could be lost if conditions continue to degrade.~~

~~The number of barriers that are lost or potentially lost and the following criteria determine the appropriate emergency classification level:~~

~~Unusual Event: Any loss or any potential loss of Containment~~

~~Alert: Any loss or any potential loss of either Fuel Clad or RCS~~

~~Site Area Emergency: Loss or potential loss of any two barriers~~

~~General Emergency: Loss of any two barriers and loss or potential loss of third barrier~~

~~The logic used for emergency classification based on fission product barrier monitoring should reflect the following considerations:~~

~~The ability to escalate the emergency classification as an event deteriorates must be maintained. For example, RCS leakage steadily increasing would represent an increasing risk to public health and safety.~~

~~Fission product barrier monitoring must be capable of addressing dynamic conditions. If reaching a loss or potential loss threshold is imminent (i.e., within 1 to 2 hours) while an event or multiple events occur, judgment dictates that the imminent situation deserves classification as if the thresholds were actually exceeded.~~

~~B. Category R – Radiological Effluent / Abnormal Rad Levels~~

~~Many EALs are based on actual or potential degradation of fission product barriers because of the elevated potential for offsite radioactivity release. Degradation of fission product barriers though is not always apparent via non-radiological symptoms. Therefore, direct indication of elevated radiological effluents or area radiation levels are appropriate symptoms for emergency classification.~~

~~At lower levels, abnormal radioactivity releases may be indicative of a failure of containment systems or precursors to more significant releases. At higher release rates, offsite radiological conditions may result which require offsite protective actions.~~

~~Elevated area radiation levels in plant may also be indicative of the failure of containment systems or preclude access to plant vital equipment necessary to ensure plant safety.~~

~~Events of this category pertain to the following subcategories:~~

1. ~~Radiological Effluents~~

~~Direct indication of effluent radiation monitoring systems provides a rapid assessment mechanism to determine releases in excess of classifiable limits. Projected offsite doses, actual offsite field measurements or measured release rates via sampling indicate doses or dose rates above classifiable limits.~~

~~2. Abnormal Radiation Levels~~

~~Sustained general area radiation levels in excess of those indicating loss of control of radioactive materials or those levels which may preclude access to vital plant areas also warrant emergency classification.~~

~~C. Category H – Hazards~~

~~Hazards are non plant, system-related events that can directly or indirectly affect plant operation, reactor plant safety or personnel safety.~~

~~The events of this category pertain to the following subcategories:~~

~~1. Security~~

~~Unauthorized entry attempts into the Protected Area, bomb threats, sabotage attempts, and actual security compromises threatening loss of physical control of the plant.~~

~~2. Control Room Evacuation~~

~~Events that are indicative of loss of Control Room habitability. If the Control Room must be evacuated, additional support for monitoring and controlling plant functions is necessary through the emergency response facilities.~~

~~3. Natural & Destructive Phenomena~~

~~Natural events include hurricanes, earthquakes or tornados that have potential to cause plant structure or equipment damage of sufficient magnitude to threaten personnel or plant safety. Non naturally occurring events that can cause damage to plant facilities and include vehicle crashes, missile impacts from turbine failure, etc. are included.~~

~~4. Fire or Explosion~~

~~Fires can pose significant hazards to personnel and reactor safety. Appropriate for classification, are fires within the site Protected Area or which may affect operability of vital equipment.~~

~~5. Toxic / Flammable Gas~~

~~Non-naturally occurring events that can cause damage to plant facilities and include toxic or flammable gas leaks.~~

~~6. Judgment~~

~~The EALs defined in other categories specify the predetermined symptoms or events that are indicative of emergency or potential emergency conditions and thus warrant classification. While these EALs have been developed to address the full spectrum of possible emergency conditions which may warrant classification and subsequent implementation of the Emergency Plan, a provision for classification of emergencies based on operator/management experience and~~

~~judgment is still necessary. The EALs of this category provide the {Interim Emergency Director}, {Emergency Plant Manager} and/or {Emergency Director} the latitude to classify emergency conditions consistent with the established classification criteria based upon their judgment.~~

~~D. Category S – System Malfunction~~

~~Numerous system-related equipment failure events that warrant emergency classification have been identified in this category. They may pose actual or potential threats to plant safety.~~

~~The events of this category pertain to the following subcategories:~~

~~1. Loss of AC Power~~

~~Loss of vital plant AC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity. This category includes total losses of vital plant power sources.~~

~~2. Loss of DC Power~~

~~Loss of vital plant DC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity.~~

~~3. Failure of Protection System~~

~~Events related to failure of the Protection System (PS) to initiate and complete reactor trips. In the plant licensing basis, postulated failures of the PS to complete a reactor trip comprise a specific set of analyzed events referred to as Anticipated Transient Without Scram (ATWS) events. For EAL classification however, ATWS is intended to mean any trip failure event that does not achieve reactor shutdown. If RPS actuation fails to assure reactor shutdown, positive control of reactivity is at risk and could cause a threat to Fuel Clad, RCS and Containment integrity.~~

~~4. Plant Monitoring~~

~~Certain events that degrade plant operator ability to effectively assess plant conditions within the plant warrant emergency classification. Losses of annunciators are in this subcategory.~~

~~5. Technical Specification Limits~~

~~System malfunctions may lead to loss of capability to remove heat removal the reactor core and RCS.~~

~~Only one EAL falls into this subcategory. It is related to the failure of the plant to be brought to the required plant operating condition required by technical specifications if a limiting condition for operation (LCO) is not met.~~

~~6. Communications~~

~~Certain events that degrade plant operator ability to effectively communicate with essential personnel within or external to the plant warrant emergency classification.~~

7. ~~RCS Leakage~~

   ~~The Reactor Vessel provides a volume for the coolant that covers the reactor core. The Reactor Vessel and associated pressure piping (reactor coolant system) together provide a barrier to limit the release of radioactive material should the reactor Fuel Clad integrity fail.~~

   ~~Excessive RCS leakage greater than Technical Specification limits are utilized to indicate potential pipe cracks that may propagate to an extent threatening Fuel Clad, RCS and Containment integrity.~~

9. ~~Fuel Clad Degradation (Note: Fuel Clad Degradation is number 9, 8 is a RCS leakage in Category C)~~

   ~~During normal operation, reactor coolant fission product activity is very low. Small concentrations of fission products in the coolant are primarily from the fission of tramp uranium in the Fuel Clad or minor perforations in the clad itself. Any significant increase from these base line levels (2% - 5% clad failures) is indicative of fuel failures and is covered under the Fission Product Barriers category. However, lesser amounts of clad damage may result in coolant activity exceeding Technical Specification limits. These fission products will be circulated with the reactor coolant and can be detected by coolant sampling.~~

E. ~~Category C – Cold Shutdown / Refueling System Malfunction~~

~~Category C EALs are directly associated with cold shutdown or refueling system safety functions. Given the variability of plant configurations (e.g., systems out-of-service for maintenance, containment open, reduced AC power redundancy, time since shutdown) during these periods, the consequences of any given initiating event can vary greatly. For example, a loss of decay heat removal capability that occurs at the end of an extended outage has less significance than a similar loss occurring during the first week after shutdown. Compounding these events is the likelihood that instrumentation necessary for assessment may also be inoperable. The cold shutdown and refueling system malfunction EALs are based on performance capability to the extent possible with consideration given to RCS integrity, containment closure, and Fuel Clad integrity for the applicable operating modes (5 - Cold Shutdown, 6 - Refueling, D – Defueled).~~

~~The events of this category pertain to the following subcategories:~~

1. ~~Loss of AC Power~~

   ~~Loss of vital plant AC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity. This category includes total losses of vital plant power sources.~~

2. ~~Loss of DC Power~~

   ~~Loss of vital plant DC electrical power can compromise plant safety system operability including decay heat removal and emergency core cooling systems which may be necessary to ensure fission product barrier integrity.~~

~~3. Failure of Protection System~~

~~If PS actuation fails to assure positive control of reactivity it could cause a threat to Fuel Clad, RCS and Containment integrity.~~

~~6. Communications~~

~~Certain events that degrade plant operator ability to effectively communicate with essential personnel within or external to the plant warrant emergency classification.~~

~~7 and 8. RCS Leakage (Note: Categories 7 and 8 are both RCS Leakage in NEI guidance document.)~~

~~The Reactor Vessel provides a volume for the coolant that covers the reactor core. The Reactor Vessel and associated pressure piping (reactor coolant system) together provide a barrier to limit the release of radioactive material should the reactor Fuel Clad integrity fail.~~

~~Excessive RCS leakage greater than Technical Specification limits are utilized to indicate potential pipe cracks that may propagate to an extent threatening Fuel Clad, RCS and containment integrity. This EAL, for Cold Shutdown and Refueling, will be based on RCS leakage limits that are applicable during the operational modes unless other mode specific limits have been established.~~

~~10. Heat Sink~~

~~Loss of the ability to remove decay heat could lead to fuel clad degradation.~~

3.2~~3~~ Maintenance of Emergency Action Levels

The ~~details of~~ EALs ~~development~~ are documented in an Emergency Action Level Technical Basis Document. Revision of the EAL Technical Basis Document is controlled the same way as the {BBNPP} Emergency Plan, requiring the same reviews including a review in accordance with §50.54(q).

Table 3-1, Emergency Action Levels

FISSION PRODUCT BARRIER DEGRADATION Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
FG1 1 2 3 4 1. Loss of any two barriers and loss or potential loss of the third barrier.	**FS1** 1 2 3 4 1. Loss or potential loss of any two barriers.	**FA1** 1 2 3 4 1. Any loss or any potential loss of either Fuel Clad or RCS.	**FU1** 1 2 3 4 1. Any loss or any potential loss of Containment.

RADIOLOGICAL EFFLUENT / ABNORMAL RADIATION LEVELS

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Radiological Effluents			
RG1 1 2 3 4 5 6 D Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mRem (10 mSv) TEDE or 5000 mRem (50 mSv) Thyroid CDE for the actual or projected duration of the release using actual meteorology.	**RS1** 1 2 3 4 5 6 D Offsite dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 100 mRem (1 mSv) TEDE or 500 mRem (5 mSv) Thyroid CDE for the actual or projected duration of the release.	**RA1** 1 2 3 4 5 6 D Any release of gaseous or liquid radioactivity to the environment greater than 200 times the ODCM limit for 15 minutes or longer.	**RU1** 1 2 3 4 5 6 D Any release of gaseous or liquid radioactivity to the environment greater than 2 times the ODCM limit for 60 minutes or longer.
Abnormal Radiation Levels			
		RA2 1 2 3 4 5 6 D Damage to irradiated fuel or loss of water level that has resulted or will result in the uncovering of irradiated fuel outside the reactor vessel.	**RU2** 1 2 3 4 5 6 D UNPLANNED rise in plant radiation levels.
		RA3 1 2 3 4 5 6 D Rise in radiation levels within the facility that impedes operation of systems required to maintain plant safety functions.	

HAZARDS AND OTHER CONDITIONS AFFECTING PLANT SAFETY

Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Security			
HG1 1 2 3 4 5 6 D HOSTILE ACTION resulting in loss of physical control of the facility.	**HS1** 1 2 3 4 5 6 D HOSTILE ACTION within the PROTECTED AREA.	**HA1** 1 2 3 4 5 6 D HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat.	**HU1** 1 2 3 4 5 6 D Confirmed SECURITY CONDITION or threat which indicates a potential degradation in the level of safety of the plant.
Control Room Evacuation			
	HS2 1 2 3 4 5 6 D Control Room evacuation has been initiated and plant control cannot be established.	**HA2** 1 2 3 4 5 6 D Control Room evacuation has been initiated.	
Natural or Destructive Phenomena			
		HA3 1 2 3 4 5 6 D Natural or destructive phenomena affecting VITAL AREAS.	**HU3** 1 2 3 4 5 6 D Natural or destructive phenomena affecting the PROTECTED AREA.
Fire / Explosion			
		HA4 1 2 3 4 5 6 D FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown.	**HU4** 1 2 3 4 5 6 D FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA.
Toxic / Flammable Gas			
		HA5 1 2 3 4 5 6 D Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize the ability to safely operate or shutdown the reactor.	**HU5** 1 2 3 4 5 6 D Release of toxic, corrosive, asphyxiant or flammable gases deemed detrimental to NORMAL PLANT OPERATIONS.
Judgment			
HG6 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of General Emergency.	**HS6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of Site Area Emergency.	**HA6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of an Alert.	**HU6** 1 2 3 4 5 6 D Other conditions exist which in the judgment of the {Emergency Director} warrant declaration of an Unusual Event.

SYSTEM MALFUNCTIONS - HOT Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Loss of AC Power			
SG1 1 2 3 4 Prolonged loss of all offsite and all onsite AC power to emergency busses.	**SS1** 1 2 3 4 Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.	**SA1** 1 2 3 4 AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses.	**SU1** 1 2 3 4 Loss of all offsite AC power to emergency busses for 15 minutes or longer.
Loss of DC Power			
	SS2 1 2 3 4 Loss of vital DC power for 15 minutes or longer.		
Failure of Protection System			
SG3 1 2 Automatic trip and all manual actions failed to shutdown the reactor and indication of an extreme challenge to the ability to cool the core exists.	**SS3** 1 2 Automatic trip failed to shutdown the reactor and manual actions taken from the reactor control console failed to shutdown the reactor.	**SA3** 1 2 Automatic trip failed to shutdown the reactor and the manual actions taken from the reactor control console are successful in shutting down the reactor.	**SU3** 3 4 Inadvertent criticality.
Plant Monitoring			
	SS4 1 2 3 4 Loss of all monitoring functions for 15 minutes or longer with a SIGNIFICANT TRANSIENT in progress.	**SA4** 1 2 3 4 Loss of all monitoring functions for 15 minutes or longer.	**SU4** 1 2 3 4 Degradation of monitoring functions for 15 minutes or longer.
Technical Specification Limits			
			SU5 1 2 3 4 Inability to reach required operating mode within Technical Specification limits.
Communications			
			SU6 1 2 3 4 Loss of all onsite or offsite communications capabilities.
Reactor Coolant System Leakage			
			SU7 1 2 3 4 RCS leakage.
Fuel Clad Degradation			
			SU9 1 2 3 4 Fuel clad degradation.

SYSTEM MALFUNCTIONS - COLD Modes: 1 – Power Operation, 2 – Startup, 3 – Hot Standby, 4 – Hot Shutdown, 5 – Cold Shutdown, 6 – Refueling, D – Defueled

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Loss of AC Power			
		CA1 5 6 D Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.	**CU1** 5 6 AC power capability to emergency busses reduced to a single source for 15 minutes or longer such that any additional single failure would result in a loss of all AC power to the emergency busses.
Loss of DC Power			
			CU2 5 6 Loss of required DC power for 15 minutes or longer.
Failure of Protection System			
			CU3 5 6 Inadvertent criticality.
Communications			
			CU6 5 6 D Loss of all onsite or offsite communications capabilities.
Reactor Coolant System Leakage			
CG7 5 6 Loss of RPV inventory affecting fuel clad integrity with containment challenged.	**CS7** 5 6 Loss of RPV inventory affecting core decay heat removal capability.	**CA7** 5 6 Loss of RPV inventory.	**CU7** 5 RCS leakage.
			CU8 6 UNPLANNED Loss of RCS inventory.
Heat Sink			
		CA10 5 6 Inability to maintain plant in cold shutdown.	**CU10** 5 6 UNPLANNED Loss of decay heat removal capability.

Enclosure A

{Bell Bell Nuclear Power Plant}
Summary Explanation
of
Emergency Action Levels

The originally submitted Part 5 Enclosure A is being withdrawn in entirety. This cover Enclosure A page is included with this RAI response to denote that development of Enclosure A is to be determined at a later date concurrent with completion of the EALs.

Enclosure B

{Bell Bend Nuclear Power Plant}
EAL Comparisons
and
Technical Bases for Changes

The originally submitted Part 5 Enclosure B is being withdrawn in entirety. This cover Enclosure B page is included with this RAI response to denote that development of Enclosure B is to be determined at a later date concurrent with completion of the EALs.

Enclosure C

{Bell Bend Nuclear Power Plant}
EAL Technical Bases Manual

The originally submitted Part 5 Enclosure C is being withdrawn in entirety. This cover Enclosure C page is included with this RAI response to denote that development of Enclosure C is to be determined at a later date concurrent with completion of the EALs.

Attachment 3

Proposed Revisions to
COLA Part 10, Appendix A, Item 8

8. *EMERGENCY ACTION LEVELS:*

The {BBNPP} Emergency Action Levels (EALs) and the associated Technical Bases Manual contains bracketed values requiring plant specific values to be provided that can not be determined until after the COL is issued. These bracketed values are associated with certain site specific values and detailed design information, such as setpoints and instrument numbers. In most cases, this information is necessary to determine EAL thresholds.

PROPOSED LICENSE CONDITION:

~~*{PPL Bell Bend, LLC} shall submit the plant specific values to the NRC for approval in order to address the remaining bracketed values in the {BBNPP} EALs and associated Technical Bases Manual as identified below. These plant specific values shall be submitted to the NRC within 2 years of scheduled date for initial fuel load.*~~
{PPL Bell Bend, LLC} shall submit a complete set of plant-specific Emergency Action Levels (EALs) for {BBNPP} in accordance with NEI 99-01 Revision 5 to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations other than those attributable to specific U.S. EPR reactor design considerations.

~~**Emergency Action Level**~~	~~**Parameter**~~
~~FC2(L)1~~ ~~RC2(L)1~~ ~~CT2(PL)1~~	~~Containment Radiation Monitor~~
~~FC3(L)1~~ ~~FC3(PL)1~~ ~~CT3(PL)1.a~~ ~~CT3(PL)2.a~~ ~~FC4(PL)1.b~~ ~~RC5(L)1~~ ~~SG1.b~~ ~~SG3.1.c~~	~~Calculated Clad Temperature~~
~~CT3(PL)2.b~~ ~~FC4(PL)1.a~~	~~RCS Level (hot modes)~~

~~RG1.1~~ ~~RS1.1~~ ~~RA1.1~~ ~~RU1.1~~	~~Vent Stack Noble Gas~~
~~RU2.1.a~~	~~Reactor Refueling Cavity Level~~
~~RU2.1.a~~	~~Spent Fuel Pool Level~~
~~RU2.1.a~~	~~Fuel Transfer Canal Level~~
~~SU9.1~~	~~Gross Failed Fuel Monitor~~
~~CG7.2.a~~ ~~CS7.3.b~~	~~Source Range Monitor~~
~~CS7.1.b~~ ~~CA7.1~~	~~RCS Level (cold modes)~~