FINAL SAFETY ANALYSIS REPORT

CHAPTER 17

QUALITY ASSURANCE AND RELIABILITY ASSURANCE

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17.0 QUALITY ASSURANCE AND RELIABILITY ASSURANCE

This chapter of the U.S. EPR Final Safety Analysis Report (FSAR) is incorporated by reference with supplements as identified in the following sections.

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17.1 QUALITY ASSURANCE DURING DESIGN

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17.2 QUALITY ASSURANCE DURING THE OPERATIONS PHASE

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Item in Section 17.2:

> A COL applicant that references the U.S. EPR design certification will provide the Quality Assurance Programs associated with the construction and operations phase.

This COL Item is addressed as follows:

This information is provided in Section 17.5.

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17.3 QUALITY ASSURANCE PROGRAM DESCRIPTION

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17.4 RELIABILITY ASSURANCE PROGRAM

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

17.4.1 RELIABILITY ASSURANCE PROGRAM SCOPE, STAGES, AND GOALS

No departures or supplements.

17.4.2 RELIABILITY ASSURANCE PROGRAM IMPLEMENTATION

The U.S. EPR FSAR includes the following COL Item in Section 17.4.2:

> A COL applicant that references the U.S. EPR design certification will identify the site-specific SSC within the scope of the RAP.

This COL Item is addressed as follows:

Based on a review of site-specific information, the design certification probabilistic risk assessment (PRA) is bounding and representative of the U.S. EPR plant proposed at the {Bell Bend} site. It is concluded that the U.S. EPR design-specific PRA model can be used, without modification, as the plant-specific PRA. This is based on the plant-specific features being conservatively modeled in the design-specific U.S. EPR PRA. Site and plant parameters that could influence the PRA results are addressed in the evaluation and it is determined that the design-PRA: (1) bounds or sufficiently captures site and plant parameters; and (2) the site and plant parameters do not have a significant impact on the PRA results and insights. Therefore, no changes to the design-specific internal events PRA are necessary when considering specific site and plant parameters.

Based on the above evaluation, no additional components related to the site are identified by the PRA for the site-specific RAP scope. Accordingly, the SSC identified by the PRA for consideration to be within the RAP during the design certification process are the same SSC for consideration within the plant-specific RAP scope.

Tables 17.4-1 specifies the SSC identified by the PRA for consideration within the scope of RAP.

For systems within the design certification scope, deterministic insights in the risk-significant SSC determination process are incorporated by using an expert panel. A list of systems within the design certification scope and the bases to be included within the RAP is provided in Table17.4-2.

Site specific systems were qualitatively evaluated based on deterministic criteria including but not limited to:

- A contribution to the initiators
- An implicit contribution to the CDF
- An implicit contribution to the LRF
- A contribution to seismic margin analysis, performance history/operating experience of the component
- Technical Specifications considerations for the component

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- Detection of component failures
- The effect of component failure on the other systems

As a result of this qualitative evaluation Table 17.4-3 provides a list of plant specific systems to be included within the RAP.

17.4.3 ORGANIZATION, DESIGN CONTROL, PROCEDURES AND INSTRUCTIONS, CORRECTIVE ACTIONS, AND AUDIT PLANS

No departures or supplements.

17.4.4 RELIABILITY ASSURANCE PROGRAM INFORMATION NEEDED IN A COL APPLICATION

The U.S. EPR FSAR includes the following COL Item in Section 17.4.4:

> A COL applicant that references the U.S. EPR design certification will provide the information requested in Regulatory Guide 1.206, Section C.I.17.4.4.

This COL Item is addressed as follows:

An introduction to the objectives of the Reliability Assurance Program including Design Reliability Assurance (D-RAP) is provided in the U.S. EPR FSAR Section 17.4. This section discusses post-certification D-RAP and the transition to reliability assurance activities during operations.

Reliability assurance activities are implemented in two stages. Stage 1 encompasses D-RAP conducted during certification of the U.S. EPR (described in the U.S. EPR FSAR Section 17.4) and the D-RAP for the site-specific design including procurement, construction, and fabrication and testing leading up to initial fuel load. D-RAP is largely accomplished for {PPL Bell Bend, LLC} by the NSSS vendor and the Architect Engineer.

Stage 2 reliability assurance activities are conducted principally by {PPL Bell Bend, LLC} and commence during the transition to fuel load and plant operation and are implemented concurrently with and as part of the Maintenance Rule (MR) program described in Section 17.7 and the other programs described below. The MR program is implemented prior to authorization to load fuel per 10 CFR 52.103(g).

Stage 2 reliability assurance activities continue for the life of the plant and with the MR program are implemented using traditional programs for surveillance testing, inservice inspection, inservice testing, the general preventive maintenance program and the {PPL Bell Bend, LLC} Quality Assurance Program Description.

Sections 17.4.4.1 through 17.4.4.9 are added as a supplement to the U.S. EPR FSAR.

17.4.4.1 Identification of Site-Specific SSCs for D-RAP

Section 17.4.2 describes a methodology for ensuring site-specific SSCs are identified and included in the RAP.

The initial list of site-specific SSCs and their risk rankings are included in Section 17.4.2. The PRA model will continue to be refined over the life of the plant and this will require periodic adjustment to the risk rankings of SSCs in Section 17.4.2.

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As D-RAP enters the detailed design, procurement, fabrication and construction phase, an expert panel with {PPL Bell Bend, LLC} representation will be established and utilized to:

- Augment PRA techniques in the risk ranking of SSCs using deterministic techniques, operating experience and expert judgment.
- Identify risk significant SSCs not modeled in the PRA (if any).
- Act as the final approver of risk significant SSCs.
- Recommend design changes where appropriate to reduce risk.
- Revise/adjust recommend operations phase maintenance/testing activities for risk significant SSCs described in Section 17.4.2.
- Designate and chair NSSS and Architect Engineer working groups as necessary to assist in accomplishing the objectives of the expert panel.
- Review and approve the recommendations of the working groups.
- Assess the overall station risk impact due to SSC performance and all implemented risk-informed programs (including D-RAP) after each plant-specific data update of the PRA.

The expert panel is made up of members with diverse backgrounds in engineering, operations, maintenance, risk and reliability analysis, operating experience and work control. During the detailed design phase of D-RAP, each major engineering organization performing detailed design will be represented on the panel (or working groups) as deemed necessary. The composition of the panel will change during the period leading up to fuel load and operations. The panel will continue to function during operations for the life of the plant.

17.4.4.1.1 Organization

17.4.4.1.1.1 Program Formulation and Organizational Responsibilities

{PPL Bell Bend, LLC overall site organization is described in Section 13.1. The Vice President, Engineering is responsible for formulating the reliability assurance activities as described in this section.

D-RAP is fundamentally an engineering program. The Vice president, Engineering retains responsibility for reliability assurance activities during design and construction even though implementation will reside principally with AREVA and other contractors (such as Sargent & Lundy) responsible for completion of detailed design and the development of engineering and procurement specifications. PPL Bell Bend, LLC has delineated D-RAP requirements expected of the Plant Designer (NSSS and Architect Engineer vendors) including participation on the expert panel. The organizational relationships of PPL Bell Bend, LLC and its contractors are further described in Section A of the PPL Bell Bend, LLC QAPD.

For Stage 2, the organizational emphasis will shift from engineering and construction to systems engineering and maintenance. Design engineering will continue to play a role in maintaining the Master Equipment Database (as discussed in Section 17.4.4.1.2.1), configuration control and application of the design change process, if necessary, to improve SSC reliability.

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The Expert Panel is composed of a Chairman and additional senior level managers as designated by the Senior Vice President and CNO, PPL Bell Bend, LLC. The Expert Panel membership may be augmented as determined by the Senior Vice President and CNO, PPL Bell Bend, LLC. Any change to the Expert Panel membership requires approval of the Senior Vice President and CNO, PPL Bell Bend, LLC.

The Probabilistic Risk Assessment organization maintains representation on the expert panel and has major input to determinations that SSCs are maintaining performance levels consistent with PRA model assumptions over the life of the plant. The PRA organization will report to the Management Position Responsible for Engineering.}

17.4.4.1.1.2 Reliability Assurance Interface Coordination

Reliability assurance activity interface issues are coordinated through the Expert Panel since the organizations involved have representation on the panel. Specific interface responsibilities of the panel members are detailed in a controlling procedure. These interface responsibilities include the following:

- The Plant Designer panel member maintains the design interface to ensure that any proposed design changes that involve risk significant SSCs modeled in the PRA are identified and periodically reviewed with the expert panel at a frequency determined by the panel.

- The Plant Designer panel member maintains the design interface to ensure that any proposed changes to the plant PRA model, as identified by the PRA representative on the Expert Panel, are appropriately reviewed for design impact and the results of the review appropriately distributed throughout the Plant Designer's and subcontractor's organizations.

- The Plant Designer panel member coordinates with the design organizations and expert panel members to ensure that significant design assumptions related to equipment reliability are realistic and achievable.

- The {PPL Bell Bend, LLC} PRA panel member is responsible to inform the panel of changes to the PRA model and to advise other panel members on the potential impact of the change on SSC risk rankings, assumed reliability of SSCs for design activities and the need for adjustments to the MR program.

17.4.4.1.1.3 PRA Organization Input to the Design Process

The {PPL Bell Bend, LLC} PRA panel member is responsible to review and concur in design changes involving risk significant SSCs identified by the Plant Designer's expert panel member. During implementation of the MR program prior to fuel load, responsibility for design and configuration control will transition from the Plant Designer to {PPL Bell Bend, LLC}. The procedure for Design Change Packages will ensure screening of proposed design changes and PRA review and approval when necessary.

17.4.4.1.1.4 PRA Organization Design Reviews

The PRA organization's participation in periodic design reviews is principally via the PRA configuration control program that incorporates a feedback process to update the PRA model. These updates fall into two categories:

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- The plant operating update incorporates plant design changes and procedure changes that affect PRA modeled components, initiating event frequencies, and changes in SSC unavailability that affect the PRA model. These changes will be incorporated into the model on a period not to exceed 36 months.

- The comprehensive data update incorporates changes to plant-specific failure rate distributions and human reliability, and any other database distribution updates (examples would include equipment failure rates, recovery actions, and operator actions). This second category will be updated on a period not to exceed 48 months.

The PRA model may be updated on a more frequent basis.

17.4.4.1.2 Design Control

17.4.4.1.2.1 Configuration Control of SSCs

The initial focal point for configuration control as it relates to D-RAP is the list of SSCs and their risk rankings in Section 17.4.2. During detailed design, a process will be implemented for a Master Equipment Database (MED). During the detailed design phase, this database, for the risk significant SSCs identified in Section 17.4.2, will be populated from a review performed by the Expert Panel or associated working groups.

The MED will be developed and maintained as a source of approved risk information.

17.4.4.1.2.2 Design Change Feedback

The design control and change processes provide feedback to the PRA organization via identification of components on the MED that are affected by a proposed change. Those affected SSCs with medium or high risk are given additional review in accordance with approved criteria to ensure there is no potential impact to the risk ranking of the affected components. If potential impact is identified then the Risk and Analysis Organization must concur in the change.

17.4.4.1.2.3 Design Interface with PRA Organization

Assurance that SSC performance relates to reliability assumptions made in the PRA and deterministic methods for identifying risk significant SSCs is provided by monitoring the performance of SSCs during plant operation and the review and feedback of Operating Experience. This interface occurs through implementation of the MR and the functioning of the expert panel.

A wide range of traditional sources for relevant operating information is available. The industry and vendor equipment information that is applicable and available to the nuclear industry with the intent of minimizing adverse plant conditions or situations through shared experience. Sources include the NRC (Information Notices and Generic Letters), INPO (EPIX, NPRDS, Operating Events, and Significant Event Reports, etc.) and vendor documentation and NSSS supplier information.

17.4.4.1.2.4 Engineering Design Controls for SSC Identification

Engineering design controls applied for determining the SSCs within the scope of the RAP are generally those specified in 10 CFR 50, Criterion III, "Design Control." These include, for example, the use of procedures for establishing risk via deterministic methods, proceduralized

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criteria for PRA risk ranking and independent verification and peer checking of the inputs necessary for utilization (or when necessary modification) of the site-specific PRA model.

17.4.4.1.2.5 Alternative Design

The process for proposing changes to the design for risk significant SSCs is proceduralized via the Design Change Package process. This process includes the use of a detailed checklist to establish the impact of the change on the PRA or deterministic evaluations performed to establish risk for affected SSCs. Changes identified as having an impact on SSCs and their risk rankings require appropriate special or interdisciplinary reviews.

17.4.4.1.3 Expert Panel

The Expert Panel and designated working groups consist of designated individuals having expertise in the areas of risk assessment, operations, maintenance, engineering, quality assurance, and licensing.

As a minimum, the combined expert panel and working groups include at least three individuals with a minimum of five years experience at similar nuclear plants, and at least one individual who has worked on the modeling and updating of the PRA for similar plants for a minimum of three years.

When utilized, expert panel representatives from contractor design organizations are required to have a minimum of three years experience establishing risk rankings for nuclear plant SSCs using PRA or deterministic techniques (which may include Failure Modes and Effects Analysis).

17.4.4.1.4 Methods of Analysis for Risk Significant SSC Identification

The process for maintaining, revising, and, when necessary, establishing new risk rankings for modified design are based on PRA and deterministic techniques. The process utilized in categorizing components consists of the following major tasks:

- Identification of functions performed by the subject plant system.
- Determination of the risk significance of each system function.
- Identification of the system functions supported by that component.
- Identification of a risk categorization of the component based on PRA insights (where the component is modeled).
- Development of a risk categorization of the component based on deterministic insights.
- Designation of the overall categorization of the component, based upon the higher of the PRA categorization and the deterministic categorization.
- Identification of critical attributes for components determined to be safety/risk significant.

The PRA and deterministic methods are described more fully below.

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17.4.4.1.4.1 PRA Risk Ranking

A component's risk determination is based upon its impact on the results of the PRA. Both core damage frequency (CDF) and containment response to a core damaging event, including large release frequency (LRF) are calculated. The PRA models internal initiating events at full power and low power shutdown, and also accounts for the risk associated with external events. The PRA risk categorization of a component is based upon its Fussell-Veselly (FV) importance, which is the fraction of the CDF and LRF to which failure of the component contributes, its risk achievement worth (RAW), which is the factor by which the CDF and LRF would increase if it were assumed that the component is guaranteed to fail, and its common cause failure (CCF) RAW, which is the factor by which the CDF would increase if the common cause group probability of failure is set to 1 (common cause failure is assumed to occur). Specifically, PRA risk categorization to identify SSC is based upon the following:

PRA Ranking	Criteria
Greater than Low	FV ≥ 0.005 or RAW ≥ 2.0 or CCF RAW ≥ 20
Low	FV < 0.005 and RAW < 2.0 and CCF RAW < 20

17.4.4.1.4.2 Deterministic Risk Ranking

Components are subject to a deterministic categorization process, regardless of whether they are also subject to the PRA risk categorization process. This deterministic categorization process can result in an increase, but not a decrease (from the PRA risk) in a component's categorization.

A component's deterministic categorization is directly attributable to the importance of the system function supported by the component. In cases, where a component supports more than one system function, the component is initially classified based on the highest deterministic categorization of the function supported. In categorizing the functions of a system, five critical questions regarding the function are considered, each of which is given a different weight.

These questions and their weight are as follows:

Question	Weight
Is the function used to mitigate accidents or transients?	5
Is the function specifically called out in the Emergency Operating Procedures (EOPs)?	5
Does the loss of the function directly fail another risk-significant system?	4
Is the loss of the function safety significant for shutdown or mode changes?	3
Does the loss of the function, in and of itself, directly cause an initiating event?	3

Based on the impact on safety, if the function is unavailable and the frequency of loss of the function, each of the five questions is given a numerical answer ranging from 0 to 5. This grading scale is as follows:

"0" — Negative response

"1" — Positive response having an insignificant impact and/or occurring very rarely

"2" — Positive response having a minor impact and/or occurring infrequently

"3" — Positive response having a low impact and/or occurring occasionally

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"4" — Positive response having a medium impact and/or occurring regularly

"5" — Positive response having a high impact and/or occurring frequently

The definitions for the terms used in this grading scale are as follows:

Frequency Definitions

- Occurring Frequently - continuously or always demanded
- Occurring Regularly - demanded > 5 times per year
- Occurring Occasionally - demanded 1-2 times per cycle
- Occurring Infrequently - demanded < once per cycle
- Occurring Very Rarely - demanded once per lifetime

Impact Definitions

- High Impact - a system function is lost which likely could result in core damage and/or may have a negative impact on the health and safety of the public
- Medium Impact - a system function is lost which may, but is not likely to, result in core damage and/or is unlikely to have a negative impact on the health and safety of the public
- Low Impact - a system function is significantly degraded, but no core damage and/or negative impact on the health and safety of the public is expected
- Minor Impact - a system function has been moderately degraded, but does not result in core damage or negative impact on the health and safety of the public
- Insignificant Impact - a system function has been challenged, but does not result in core damage or negative impact on the health and safety of the public

Although some of these definitions are quantitative, both of these sets of definitions are applied based on collective judgment and experience.

The numerical values, after weighting, are summed; the maximum possible value is 100. Based on the sum, functions are categorized as follows:

SCORE RANGE	CATEGORY
100–71	High Safety Significance (HSS)
70–41	Medium Safety Significance (MSS)
40–21	Low Safety Significance (LSS)
20–0	No Risk Significance (NRS)

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A function with a low categorization due to a low sum can receive a higher deterministic categorization if any one of its five questions received a high numerical answer. Specifically, a weighted score of 25 on any one question results in an HSS categorization; a weighted score of 15-20 on any one question results in a minimum categorization of MSS; and a weighted score of 9-12 on any one question results in a minimum categorization of LSS. This is done to ensure that a function with a significant risk in one area does not have that risk contribution masked because of its low risk in other areas.

In general, a component is given the same categorization as the highest categorized system function that the component supports. However, a component may be ranked lower than the associated system function based upon diverse and/or multiple independent means available to satisfy the system function.

17.4.4.2 Procurement, Fabrication, Construction, and Test Specifications

Procurement, fabrication, construction, and test specifications for safety-related and non-safety-related SSCs within the scope of RAP are prepared and implemented under the approved QAPD referenced in Section 17.5. The approved QAPD describes the planned and systematic actions necessary to provide adequate confidence that SSCs will perform satisfactorily in service. These actions are applied to procurement, fabrication, construction, and test specifications.

Assumptions related to equipment reliability and availability are translated into verifiable attributes, defined characteristics and processes and are included in procurement, fabrication, and construction specifications such that deviations from these attributes, characteristics and processes may be identified and corrected.

Procedures describing equipment selection require consideration of the manufacturer's recommended maintenance activities and the manufacturer's time estimates for accomplishing these activities such that the equipment selected is able to meet availability assumptions while in service, including conservative allowances for unplanned maintenance.

Test specifications will describe to the extent practical the actual conditions that will exist when SSCs are called upon to perform their risk significant functions and testing will document proper performance under the specified conditions when these conditions can be practically established in the field. When these conditions cannot be duplicated, acceptance will be established based on qualification testing performed by the equipment vendor under controlled conditions.

The approved QAPD applies 10 CFR 50 Appendix B (CFR, 2008a) requirements to safety-related SSCs. For non-safety-related SSCs within the scope of RAP, Section V of the QAPD describes the process for selectively applying program controls to those characteristics or critical attributes that render the SSC a significant contributor to plant safety.

Section V of the QAPD specifies the quality requirements required for non-safety-related SSCs credited in mitigating defined events such as Anticipated Transients Without Scram (ATWS) and Station Blackout (SBO). When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied.

17.4.4.3 Quality Assurance Implementation

Implementation of the QAPD during procurement, fabrication, construction and preoperational testing of SSCs is accomplished in accordance with written instructions,

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procedures or drawings of a type appropriate to the circumstances, and where applicable, include quantitative or qualitative acceptance criteria. These procedures are {PPL Bell Bend, LLC} implementing procedures or supplier implementing procedures governed by a supplier quality program approved by {PPL Bell Bend, LLC}.

17.4.4.4 Maintenance Rule/Operational Programs

The {PPL Bell Bend, LLC} MR program is described in Section 17.7. Risk significant SSCs identified by reliability assurance activities are included in the MR program as high safety significance (HSS) components (Section 17.7). The opportunity to judge SSC performance under the MR program is provided by the operational programs discussed in Section 17.7.

Many SSCs would meet the criteria to be in the MR program without considerations related to the RAP. In cases where the RAP identifies a high or medium risk SSC that would not otherwise have been in the MR program, the SSC is added. For those SSCs already in the Technical Specifications (TS), Inservice Inspection (ISI), or Inservice Testing (IST) programs, their performance under these programs is factored into the performance monitoring accomplished under the MR program.

In cases where a SSC requires periodic testing or inspection not already accommodated by an existing program, then special provisions will be made to accommodate the necessary testing or inspection, for example, in the Preventive Maintenance (PM) program.

17.4.4.4.1 Performance Goal

Reliability performance assumptions for SSCs are established under the MR at two levels of performance monitoring. The first level of performance monitoring (10 CFR 50.65(a)(2)) (CFR, 2008b) establishes conservative criteria used to judge that SSCs are meeting expected performance objectives. For SSCs, the performance monitoring criteria are established consistent with the reliability and availability assumptions used in the PRA. Failure to meet these objectives would trigger performance monitoring at the second level (10 CFR 50.65(a)(1)) accompanied by the establishment of specific defined goals to return the component to expected performance levels (Section 17.7). These specific defined goals also consider the reliability and availability assumptions used in the PRA.

17.4.4.4.2 Feedback of Actual Equipment Performance and Operating Experience

The feedback mechanism for periodically evaluating reliability assumptions based on actual equipment, train or system performance is realized in the implementation of the MR program. Since the performance monitoring criteria established under the MR program are set consistent with the assumed reliability assumptions used in the PRA, the failure to meet these performance objectives (i.e., equipment, train or system placed in 10 CFR 50.65(a)(1) category) requires an assessment of the assumed reliability as described in Section17.4.4.4.1 above. This assessment requires that the assumed reliability be reviewed to ensure it is reflective of actual {PPL Bell Bend, LLC} and industry performance. The process requires review by the PRA organization to concur that goals have been met before moving a component from a 10 CFR 50.65(a)(1) status back to a 10 CFR 50.65(a)(2) status.

17.4.4.5 Non-Safety SSC Design/Operational Errors

The process for providing corrective actions for design and operational errors that degrade non-safety-related SSCs within the scope of RAP is procedurally defined. All SSCs (safety-related or non-safety-related) with risk significance greater than “low” are entered into the MR program as HSS. The {PPL Bell Bend, LLC} MR program does not distinguish between a

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Maintenance Rule Functional Failure (MRFF) and a Maintenance Preventable Functional Failure (MPFF). Therefore, non-safety-related SSCs that have experienced a MRFF attributable to a design or operating error (i.e., could not have been prevented by maintenance) are corrected using the corrective action process described in the QAPD. Under the MR program, MRFFs require cause determination (may be an apparent cause determination) and corrective action is implemented to prevent recurrence.

17.4.4.6 Procedural Control

Implementation of the reliability assurance activities is considered an activity affecting quality and the controls for procedures and instructions used to implement reliability assurance activities are specified in Section A through U and W (safety-related) and Section V (non-safety-related risk significant) of the QAPD. In most cases where a single procedure describes the process for an activity that applies to both safety-related and non-safety-related components (for example, establishing the performance monitoring criteria for the MR or establishing risk significance for SSCs in RAP), a single procedure or procedures that meet the full quality program requirements of QAPD will be utilized. For activities such as procurement, non-safety-related SSCs in the RAP will be governed by Procedure Controls meeting the requirements of Section V of the QAPD.

Section V of the QAPD specifies the quality requirements required for non-safety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied.

17.4.4.7 Records

Implementation of the reliability assurance activities is considered an activity affecting quality and the generation of records associated with this activity will meet the requirements of the QAPD.

Records of Expert Panel decisions and supporting documents are retained as QA records in the Records Management System (RMS) and consist of:

- Expert Panel decisions and meeting minutes including dissenting opinions and resolutions.
- Recommendations of the working groups.

The PRA includes models for power operation and for low-power and shutdown operation. For each model, documentation is maintained that includes sources of input data, modeling techniques, and assumptions used in the analysis. These documents are maintained in RMS for the life of the plant.

Section V of the QAPD specifies the quality requirements required for non-safety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events, the specified quality requirements for these SSCs will be satisfied.

17.4.4.8 Corrective Action Process

Under the {PPL Bell Bend, LLC} process for MR implementation, any SSC experiencing a MRFF requires use of the Corrective Action process to document the failure, its cause determination

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and actions to preclude recurrence. As previously discussed in Section 17.4.4.5, this also includes non-safety-related SSCs.

Other failures of SSCs that are not MRFFs will be documented and corrected as described by the QAPD, Section P and Section V.

Section V of the QAPD specifies the quality requirements required for non-safety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events, the specified quality requirements for these SSCs will be satisfied.

17.4.4.9 Audit Plans

The reliability assurance activities are collectively accomplished by programs related to design, procurement, fabrication, construction, preoperational testing, PRA modeling and PRA risk assessment, deterministic evaluations from the expert panel, maintenance rule, Technical Specifications and other operational programs and the corrective action program. These programs are subject to audit as described in the QAPD.

Section V of the QAPD specifies the quality requirements required for non-safety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events, the specified quality requirements for these SSCs will be satisfied.

17.4.5 REFERENCES

{**CFR, 2008a**. Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, Title 10, Code of Federal Regulations, Part 50, Appendix B, U.S. Nuclear Regulatory Commission, 2008.

CFR, 2008b. Requirements for monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Title 10, Code of Federal Regulations, Part 50.65, U.S. Nuclear Regulatory Commission, 2008.}

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Table 17.4-1—Input to RAP List from Importance Measures and Initiating Event Contribution

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EQUIPMENT DEFINITION						RATIONALE FOR SELECTION											
System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
CCWS	30KAAX0AA004	CCWS, Discharge from CCW HTX Check Valves KAA10/20/30/40AA004	4	Check Valve	Fails to Remain Open, Spurious Operation (CL)			x					x			x	
CCWS	30KAAX2AA005	CCWS, LHSI HTX Cooling MOVs KAA12/22/32/42AA005	4	MOV	Fails to Open on Demand (FO)	x	x	x	x		x		x			x	
CCWS	30KAAX2AA012	CCWS, LHSI HTX Discharge Check Valves KAA12/22/32/42AA012	4	Check Valve	Fails to Open on Demand (FO)			x			x		x			x	
CCWS	30KAAX2AA101	CCWS, Common Header QKA20/30 Chiller Return 3-Way MOVs KAA22/32AA101	2	MOV	Fails to Remain Open, Spurious Operation (CL)		x										
CCWS	30KAAX0AC001	CCWS, Train HTX KAA10/20/30/40AC001	4	HTX	External leakage (EL)		x						x			x	
CCWS	30KAAX0AP001	CCWS, Motor Driven Pumps KAA10/20/30/40AP001	4	Pump	External leakage (EL)		x					x	x		x	x	
CCWS	30KAAX0BB001	CCWS, Train Surge Tank KAA10/20/30/40BB001	4	Tank	External Leakage (EL)		x						x			x	
CCWS	30KAB30AA191/192	CCWS, CCWS CH RCP TB Return Safety Valves KAB30AA191/192	2	Safety Valve	Premature Opening (PO)		x										
CCWS	30KABX0AA191	CCWS, CVCS HP Cooler Return Safety Valves KAB60/70AA191	2	Safety Valve	Premature Opening (PO)		x										
CCWS	30KABX0AA192	CCWS, CCWS CH Return Safety Valves KAB10/20AA192	2	Safety Valve	Premature Opening (PO)		x										
CCWS	30KABX0AA193	CCWS, FPCS Train Cooling Header Safety Valves KAB10/20AA193	2	Safety Valve	Premature Opening (PO)		x										

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Table 17.4-1—Input to RAP List from Importance Measures and Initiating Event Contribution

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EQUIPMENT DEFINITION						RATIONALE FOR SELECTION											
System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
CLCWS	30PGB19AA191	CLCWS, Safety Valve PGB19AA191	1	Safety Valve	Premature Opening (PO)		x										
CVCS	30KBA14AA004/106	CVCS, Low Pressure Reducing Station Isolation MOVs KBA14AA004/106	2	MOV	Fails to Close on Demand (FC)							x	SD IE	SD IE	x	SD IE	SD IE
EFWS	30LARX1AA103	EFWS, SG Pressure Control MOVs LAR11/41AA103	2	MOV	Fails to Control Flow (CF)		x										
EFWS	30LARX1AA105	EFWS, SG Level Control MOVs LAR11/41AA005	2	MOV	Fails to Control Flow (CF)		x										
EFWS	30LARX0BB001	EFWS, EFW Storage Tanks LAR10/20/30/40BB001	4	Tank	External Leakage (EL)		x										
EFWS	30LASX1AP001	EFWS, Motor Driven Pumps LAS11/21 /31 /41AP001	4	Pump	Fails to Run (FR)	x	x	x	x		x	x			x		
ELEC	3XBTB01_BAT	ELEC, 250V Non 1E 12-hr Batteries 31/32BTB01	2	Battery	Fails on Demand (ST)		x			x			x				
ELEC	3XBTD01_BAT	ELEC, 250V 1E 2-hr Batteries 31/32/33/34BTD01	4	Battery	Fails on Demand (ST)	x	x	x	x	x	x	x	x	x	x	x	x
ELEC	3XBUC	ELEC, 250V DC Bus 31/ 34BUC	2	Bus	Fails During Operation (FL)		x			x			x			x	
ELEC	3XBUD	ELEC, Non 1E 250V DC Distribution Panels 31/ 32BUD	2	Bus	Fails During Operation (FL)		x						x				
ELEC	3XBTD01	ELEC, 250V Battery 31/ 34BTD01 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	3XBMBXBNT01	ELEC, 480V Load Center 31/ 34BMB to Transformer 31/ 34BNT01 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)								x			x	

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EQUIPMENT DEFINITION						RATIONALE FOR SELECTION											
System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
ELEC	31BDA_1BDC1/2	ELEC, 6.9kV SWGR 31 BDA to 6.9kV SWGR 31 BDC1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x						x	
ELEC	31BDA_1BDD1/2	ELEC, 6.9kV SWGR 31 BDA to 6.9kV SWGR 31 BDD1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	31BDB1BMT02	ELEC, 6.9kV SWGR 31 BDB to Transformer 31 BMT02 Circuit Breaker	1	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x			x			x	
ELEC	31BDC_1BDB1/2	ELEC, 6.9kV SWGR 31 BDC to 6.9kV SWGR 31 BDB1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x			x			x	
ELEC	31BDD1BMT04	ELEC, 6.9kV SWGR 31 BDD to Transformer 31 BMT04 Circuit Breaker	1	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	32BDA_2BDB1/2	ELEC, 6.9kV SWGR 32BDA to 6.9kV SWGR 32BDB1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x						x	
ELEC	32BDB2BMT02	ELEC, 6.9kV SWGR 32BDB to Transformer 32BMT02 Circuit Breaker	1	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x						x	
ELEC	33BDA_3BDB1/2	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDB1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x										
ELEC	33BDB3BMT02	ELEC, 6.9kV SWGR 33BDB to Transformer 33BMT02 Circuit Breaker	1	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x										
ELEC	34BDA_4BDC1/2	ELEC, 6.9kV SWGR 34BDA to 6.9kV SWGR 34BDC1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
ELEC	34BDA_4BDD1/2	ELEC, 6.9kV SWGR 34BDA to 6.9kV SWGR 34BDD1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	34BDB4BMT02	ELEC, 6.9kV SWGR 34BDB to Transformer 34BMT02 Circuit Breaker	1	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	34BDC_4BDB1/2	ELEC, 6.9kV SWGR 34BDC to 6.9kV SWGR 34BDB1/2 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	34BDD4BMT04	ELEC, 6.9kV SWGR 34BDD to Transformer 34BMT04 Circuit Breaker	1	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	3XBDT01_XBDA	ELEC, Aux Transformer 30BDT01 to 6.9kV SWGR 31/32/33/34BDA Circuit Breaker	4	Circuit Breaker	Fails to Open on Demand (FO)			x			x			x			x
ELEC	3XBDT02_XBDA	ELEC, Aux Transformer 30BDT02 to 6.9kV SWGR 31/32/33/34BDA Circuit Breaker	4	Circuit Breaker	Fails to Open on Demand (FO)			x			x			x			x
ELEC	3XKAX0_XBDA	ELEC, EDG XKA10/20/30/40 to 6.9kV SWGR 31/32/33/34BDA Circuit Breaker	4	Circuit Breaker	Fails to Close on Demand (FC)			x			x			x			x
ELEC	3XBRU01XBRA	ELEC, Inverter 31/32BRU01 to 480V MCC 31/32BRA Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x						x	
ELEC	3XBMT02XBMB	ELEC, Transformer 31/32/33/34BMT02 to 480V Load Center 31/32/33/34BMB Circuit Breaker	4	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x			x			x			x	

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
ELEC	3XBMT04XBMD	ELEC, Transformer 31/34BMT04 to 480V Load Center 31/34BMD Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)		x						x			x	
ELEC	3XBNT01XBNB02	ELEC, Transformer 31/34BNT01 to 480V MCC 31/34BNB02 Circuit Breaker	2	Circuit Breaker	Fails to Remain Closed, Spurious Operation (OP)								x			x	
ELEC	30XKAX0	ELEC, Emergency Diesel Generators XKA10/20/30/40	4	Diesel Generator	Fails to Run (FR)	x		x	x		x	x		x	x		x
ELEC	30XKA50/60	ELEC, SBO Diesel Generators XKA50/80	2	Diesel Generator	Fails to Run (FR)	x			x			x	x		x	x	
ELEC	3XBRU03	ELEC, Inverters 31/32BRU03	2	Inverter	Fails to Run (FR)		x										
ELEC	3XBMB	ELEC, 480V Load Centers 31/32/33/34BMB	4	Load Center	Fails During Operation (FL)		x			x			x			x	
ELEC	3XBMD	ELEC, 480V Load Center 31/34BMD	2	Load Center	Fails During Operation (FL)		x						x			x	
ELEC	35BFE	ELEC, 480V Load Center 35BFE	1	Load Center	Fails During Operation (FL)		x										
ELEC	3XBNB01	ELEC, 480V MCC 31/34BNB01	2	MCC	Fails to Run (FR)		x			x			x			x	
ELEC	3XBNB02	ELEC, 480V MCC 31/32/34BNB02	3	MCC	Fails to Run (FR)		x						x			x	
ELEC	3XBRA	ELEC, 480V MCC 31/32/33/34BRA	4	MCC	Fails to Run (FR)	x	x		x	x						x	
ELEC	3XBRB	ELEC, 480V MCC 31/34BRB	2	MCC	Fails to Run (FR)		x										
ELEC	3XBRC	ELEC, 480V MCC 31/32BRC	2	MCC	Fails During Operation (FL)		x										

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
ELEC	3XBRWXXBUWXX	ELEC, 24V DC I&C Power Rack 31BRW10/31BUW11 32BRW32/32BUW33 BRW52/BUW53 34BRW70/ 34BUW71	4	Power Rack	Fails During Operation (FL)		x			x			x				
ELEC	3XBDA	ELEC, 6.9kV SWGR 31/32/ 33/34BDA	4	SWGR	Fails During Operation (FL)		x			x							
ELEC	3XBDB	ELEC, 6.9kV SWGR 31/32/ 33/34BDB	4	SWGR	Fails During Operation (FL)		x			x			x			x	
ELEC	3XBDC	ELEC, 6.9kV SWGR 31/ 34BDC	2	SWGR	Fails During Operation (FL)		x			x			x			x	
ELEC	3XBDD	ELEC, 6.9kV SWGR 31/ 34BDD	2	SWGR	Fails During Operation (FL)		x						x			x	
ELEC	35BBA	ELEC, 13.8kV SWGR 35BBA	1	SWGR	Fails During Operation (FL)		x										
ELEC	3XBRU0301	ELEC, Inverter BRU03 Bypass Switch 31/ 32BRU0301	2	Switch	Fails to Remain Closed, Spurious Operation (OP)		x										
ELEC	3XBMT02	ELEC, 6.9kV-480V Transformer 31/32/33/ 34BMT02	4	Transformer	Fails During Operation (FL)		x			x			x			x	
ELEC	3XBMT04	ELEC, 6.9kV-480V Transformer 31/34BMT04	2	Transformer	Fails During Operation (FL)		x						x			x	
ELEC	3XBNT01	ELEC, Constant Voltage Transformer 31/34BNT01	2	Transformer	Fails During Operation (FL)								x			x	
ELEC	35BFT05	ELEC, 13.8kV-480V Transformer 35BFT05	1	Transformer	Fails During Operation (FL)		x										
ESWS	30PEBX0AA004	ESWS, Pump Discharge Check Valves PEB10/20/30/ 40AA004	4	Check Valve	Fails to Remain Open, Spurious Operation (CL)			x						x			x

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
ESWS	30PEBX0AA005	ESWS, Pump Discharge Isolation MOVs PEB10/20/30/40AA005	4	MOV	Fails to Remain Open, Spurious Operation (CL)		x										
ESWS	30PEBX0AP001	ESWS, Motor Driven Pumps PEB10/20/30/40AP001	4	Pump	Fails to Start on Demand (FS)		x					x			x		
ESWS	30PEDX0AN001	UHS, Cooling Tower Cooling Fans PED10/20/30/40AN001	4	Fan	Fails to Run (FR)		x	x			x						
ESWS	30PEDX0AN002	UHS, Cooling Tower Cooling Fans PED10/20/30/40AN002	4	Fan	Fails to Start on Demand (FS)	x	x	x	x		x						
HVAC	30SAC3XAA002	SAC, Normal Air Exhaust Motor Operated Dampers SAC31/32/33/34AA002	4	MOV Damper	Fails to Remain Open, Spurious Operation (CL)		x										
HVAC	30SAC3XAA003	SAC, Normal Air Exhaust Supply Fan Discharge Check Dampers SAC31/32/33/34AA003	4	Check Damper	Fails to Remain Open, Spurious Operation (CL)		x	x						x			x
HVAC	30SAC0XAA003	SAC, Normal Air Inlet Motor Operated Dampers SAC01/02/03/04AA003	4	MOV Damper	Fails to Remain Open, Spurious Operation (CL)		x										
HVAC	30SAC0XAA005	SAC, Normal Air Inlet Supply Fan Discharge Check Dampers SAC01/02/03/04AA005	4	Check Damper	Fails to Open on Demand (FO)		x	x		x	x			x			x
HVAC	30SAC3XAN001	SAC, Normal Air Exhaust Fans SAC31/32/33/34AN001	4	Fan	Fails to Run (FR)	x	x	x	x	x	x	x		x	x		x
HVAC	30SAC0XAN001	SAC, Normal Air Supply Fans SA01/02/03/04AN001	4	Fan	Fails to Run (FR)	x	x	x	x	x	x	x		x	x		x

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
IRWST	30JNK1XAT001	IRWST, SIS Sump Strainers to MHSI/LHSI Pumps 1/4 JNK10/11AT001	2	Strainer	Plugs (PG)			x			x	x		x	x		x
IRWST	30JNK1XAT002	IRWST, SIS Sump Strainers to MHSI/LHSI Pumps 2/3 JNK10/11AT002	2	Strainer	Plugs (PG)			x			x	x		x	x		x
IRWST	30JNK10AT003	IRWST, CVCS Sump Strainer JNK10AT003	1	Strainer	Plugs (PG)			x			x	x		x	x		x
IRWST	30JNK11AT003	IRWST, SAHR Sump Strainer JNK11AT003	1	Strainer	Plugs (PG)			x			x	x	x	x	x		x
MFWS	30LAB3XAA001	FWS, HP Heater Bypass Pneumatic Valves LAB31/ 32AA001	2	Pneumatic Valve	Fails to Remain Open, Spurious Operation (CL)		x										
MFWS	30LAB3XAA002	FWS, HP Heater Bypass Pneumatic Valves LAB31/ 32AA002	2	Pneumatic Valve	Fails to Remain Open, Spurious Operation (CL)		x										
MSS	30LBAX3AA001	MSS, MSRIVs LBA13/23/33/ 43AA001	4	Pneumatic Valve	Fails to Close on Demand (FC) & Fails to Open on Demand (FO)	x		x	x		x						
MSS	30LBAX0AA002	MSS, Main Steam Isolation Valves LBA10/20/30/ 40AA002	4	Pneumatic Valve	Fails to Remain Open (CL) & Fails to Close on Demand (FC)	x	x	x	x		x						
MSS	30LBAX3AA101	MSS, MSRCVs LBA 13/23/ 33/43AA101	4	MOV	Fails to Close on Demand (FC)	x	x		x	x							
MSS	30LBAXXAA191	MSS, Main Steam Safety Relief Valves LBA11/12/21/ 22/31/32/ 41/42AA191	8	Safety Valve	Fails to Open on Demand (FO)			x			x						

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
MSS	30LBAX3AA712	MSS, Train 1/2/3/4a MSRIV Pneumatic Pilot Valves LBA13/23/33/43AA712	4	Pneumatic Valve	Fails to Open on Demand (FO)	x		x			x						
MSS	30LBAX3AA713	MSS, Train 1/2/3/4a MSRIV Pneumatic Pilot Valves LBA13/23/33/43AA713	4	Pneumatic Valve	Fails to Open on Demand (FO)	x		x			x						
MSS	30LBAX3AA716	MSS, Train 1/2/3/4b MSRIV Pneumatic Pilot Valves LBA13/23/33/43AA716	4	Pneumatic Valve	Fails to Open on Demand (FO)	x		x			x						
MSS	30LBAX3AA717	MSS, Train 1/2/3/4b MSRIV Pneumatic Pilot Valves LBA13/23/33/43AA717	4	Pneumatic Valve	Fails to Open on Demand (FO)	x		x			x						
MSS	30LBAX3AA722	MSS, Train 1/2/3/4a MSRIV Solenoid Pilot Valves LBA13/23/33/43AA722	4	SOV	Fails to Open on Demand (FO)			x			x						
MSS	30LBAX3AA723	MSS, Train 1/2/3/4a MSRIV Solenoid Pilot Valves LBA13/23/33/43AA723	4	SOV	Fails to Open on Demand (FO)			x			x						
MSS	30LBAX3AA726	MSS, Train 1/2/3/4b MSRIV Solenoid Pilot Valves LBA13/23/33/43AA726	4	SOV	Fails to Open on Demand (FO)			x			x						
MSS	30LBAX3AA727	MSS, Train 1/2/3/4b MSRIV Solenoid Pilot Valves LBA13/23/33/43AA727	4	SOV	Fails to Open on Demand (FO)			x			x						
OCWS	30QNA2XAN001	OCWS, Train 1A/2A/1B/2B Chiller Units QNA21/22/23/24AN001	4	Chiller	Fails to Run (FR)					x							

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
PS	CLX22EQ011LV60SM/NS	ALU-A1 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									
PS	CLX22EQ021LV60SM/NS	ALU-A2 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									
PS	CLX22EQ001LV60SM/NS	ALU-B1 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									
PS	CLX22EQ002LV60SM/NS	ALU-B2 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									
PS	CLX21EQ002LV60SM/NS	APU-2 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									
PS	CLX23EQ001LV60SM/NS	APU-3 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									

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System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
PS	CLX23EQ002LV60SM/NS	APU-4 Train 1/2/3/4 Protection System Computer Processors (Self-Monitored & Non-Self-Monitored)	8	Processor	Fails to Perform Its Function			x									
PS	CL-PS-A/B-SWCCF	Protection System diversity group A&B Software	2	Software	Fails to Perform Its Function			x									
PS	JEF10CP801/803/805/807-SNPFL	Train 1/2/3/4 Pressurizer (RCS) pressure sensor	4	Sensor	Fails to Perform Its Function			x									
PS	LBM40CP811/821/831/841-SNPFL	Train 1/2/3/4 SG4 pressure sensors	4	Sensor	Fails to Perform Its Function			x									
PS	CL-TXS-OSCCF	TXS operating system software or multiple diversity groups	1	Software	Fails to Perform Its Function			x									
RCS	30JEBX0 SSSF	Stand Still Seal for RCP1/2/3/4	4	Stand Still Seal	Seal Failure (SF)		x										
RCS	30JEBX0AA010	RCP, RCP Leakoff Isolation MOVs JEB10/20/30/40AA010	4	MOV	Fails to Close on Demand (FC)	x	x										
RCS	30JEBX0AA018	RCP Seal, RCP Nitrogen Supply Solenoid Valves JEB10/20/30/40AA018	4	SOV	Fails to Open on Demand (FO)		x										
RCS	30JEBX0AA019	RCP Seal, RCP Nitrogen Supply Check Valves JEB10/20/30/40AA019	4	Check Valve	Fails to Open on Demand (FO)		x										
RCS	30JEB10AA020	RCP Seal, RCP Seal Nitrogen Venting Isolation MOVs JEB10/20/30/40AA020	4	MOV	Fails to Close on Demand (FC)	x	x										

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Table 17.4-1—Input to RAP List from Importance Measures and Initiating Event Contribution

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EQUIPMENT DEFINITION						RATIONALE FOR SELECTION											
System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
RCS	30JEBX0AP001	RCP, RCP Pumps JEB10/20/30/40AP001 13.8kV SWGR 31/32/33/34BBC Circuit Breakers	4	Pump	Fails to Open on Demand (FO)		x										
SAHRS	30JMQ40AP001	SAHR, Motor Driven Pump JMQ40AP001	1	Pump	Fails to Start on Demand (FS)	x							x		x	x	
SCWS	30QKAX0AA003	SCWS, Safety Chiller Pump Discharge Check Valves QKA10/20/30/40AA003	4	Check Valve	Fails to Open on Demand (FO)		x	x		x	x		x	x		x	x
SCWS	30QKAX0AA101	SCWS, Chiller By-pass MOVs QKA10/20/30/40AA101	4	MOV	Fails to Control Flow (CF)		x						x			x	
SCWS	30QKA40AA108	SCWS, Train 4 Safety Chiller Pump Discharge Check Valve QKA40AA108	1	Check Valve	Fails to Open on Demand (FO)					x	x						
SCWS	30QKAX0AP107	SCWS, Motor Driven Safety Chiller Pumps QKA10/20/30/40AP107	4	Pump	Fails to Run (FR)	x	x	x	x	x	x	x	x	x	x	x	x
SCWS	30QKAX0GH001	SCWS, Chiller Units QKA10/20/30/40GH001	4	Chiller	Fails to Start on Demand (FS)	x	x	x	x	x	x	x	x		x	x	
SCWS	30QKCX0AA101	SCWS, Return from SAC MOVs QKC10/20/30/40AA101	4	MOV	Fails to Remain Open, Spurious Operation (CL)		x										
SIS/RHRS	30JNAX0AA001	RHR, LHSI Pump Hot Leg Isolation MOVs JNA10/20/30/40AA001	4	MOV	Fails to Open on Demand (FO)			x			x				x		
SIS/RHRS	30JNAX0AA002	RHR, LHSI Pump Hot Leg Isolation MOVs JNA10/20/30/40AA002	4	MOV	Fails to Open on Demand (FO)			x			x				x		

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Table 17.4-1—Input to RAP List from Importance Measures and Initiating Event Contribution

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EQUIPMENT DEFINITION						RATIONALE FOR SELECTION											
System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
SIS/RHRS	30JNAX0AA003	RHR, LHSI Pump Hot leg Isolation MOVs JNA10/20/30/40AA003	4	MOV	Fails to Open on Demand (FO)			x			x						
SIS/RHRS	30JNAX0AA191	RHR, LHSI Train Safety Valves JNA10/20/30/40AA191	4	Safety Valve	Premature Opening (PO)							x	SD IE		x	SD IE	
SIS/RHRS	30JNDX0AA003	MHSI, MHSI Pump Discharge Manual CHECK Valves JND10/20/30/40AA003	4	Check Valve	Left in Wrong Position, Non-Monitored (MEC3)	x		x				x	SD IE	SD IE	x	SD IE	SD IE
SIS/RHRS	30JNDX0AA007	MHSI, MHSI Pump Discharge Check Valves JND10/20/30/40AA007 (CIV)	4	Check Valve	Fails to Open on Demand (FO)			x						x			x
SIS/RHRS	30JNDX0AP001	MHSI, MHSI Motor Driven Pumps JND10/20/30/40AP001	4	Pump	Fails to Run (FR)	x		x			x	x		x	x		x
SIS/RHRS	30JNGX0AA001	LHSI, LHSI Pump Suction from IRWST MOVs JNG10/20/30/40AA001	4	MOV	Fails to Close on Demand (FC)							x	SD IE		x	SD IE	
SIS/RHRS	30JNGX0AA003	LHSI, LHSI Radial Miniflow MOTOR OPERATED Check Valves JNG10/20/30/40AA003	4	MOV	Fails to Remain Closed, Spurious Operation (OP)							x	SD IE		x	SD IE	
SIS/RHRS	30JNGX0AA004	LHSI, LHSI Tangential Miniflow MOTOR OPERATED CVs JNG10/20/30/40AA004	4	MOV	Fails to Close on Demand (FC)			x			x	x	SD IE		x	SD IE	
SIS/RHRS	30JNGX3AA005	LHSI, CL1/2/3/4 First SIS Isolation Check Valves JNG13/23/33/43AA005	4	Check Valve	Fails to Open on Demand (FO)	x	x	x	x		x	x	x	x	x	x	x

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Table 17.4-1—Input to RAP List from Importance Measures and Initiating Event Contribution

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EQUIPMENT DEFINITION						RATIONALE FOR SELECTION											
System	Component General ID	Component Description	Number of Components	Component Type	Dominant Failure Mode	FV - PWR CDF	RAW - PWR CDF	CCF RAW - PWR CDF	FV - PWR LRF	RAW - PWR LRF	CCF RAW - PWR LRF	FV - SD CDF	RAW - SD CDF	CCF RAW - SD CDF	FV - SD LRF	RAW - SD LRF	CCF RAW - SD LRF
SIS/RHRS	30JNGX0AA006	LHSI, LHSI CL1/2/3/4 Discharge Manual CHECK Valves JNG10/20/30/40AA006	4	Check Valve	Left in Wrong Position, Non-Monitored (MEC3)	x		x			x		x	x		x	x
SIS/RHRS	30JNGX0AA009	LHSI, LHSI Pump Discharge Check Valves JNG10/20/30/40AA009	4	Check Valve	Fails to Open on Demand (FO)			x			x		x	x		x	x
SIS/RHRS	30JNGX0AA011	LHSI, LHSI Pump Discharge Check Valves JNG10/20/30/40AA011	4	Check Valve	Fails to Open on Demand (FO)			x			x						
SIS/RHRS	30JNGX0AA104	LHSI, LHSI Pump Throttle Control MOVs JNG10/20/30/40AA104	4	MOV	Fails to Control Flow (CF)		x										
SIS/RHRS	30JNGX0AA192	LHSI, LHSI/RHR Train Overpressure Protection Safety Valves JNG10/20/30/40AA192	4	Safety Valve	Fails to Open on Demand (FO)							x	SD IE		x	SD IE	
SIS/RHRS	30JNGX0AC001	LHSI, LHSI Train HTX JNG10/20/30/40AC001	4	HTX	Tube Leakage (LK)		x						x			x	
SIS/RHRS	30JNGX0AP001	LHSI, LHSI Motor Driven Pumps JNG10/20/30/40AP001	4	Pump	Fails to Start on Demand (FS)	x		x			x	x	x		x	x	

CCF – Common cause failure
CDF – Core damage frequency
FV – Fussell-Vessely
LRF – Large release frequency
PWR – Power
RAW – Risk achievement worth
SD IE – Shutdown initiating event

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Table 17.4-2—Design Certification Scope Systems Included Within RAP

(Page 1 of 2)

System Name	Rationale for Selection
NSSS SUPPORT SYSTEMS	
Fuel Handling System	Added by expert panel
Chemical & Volume Control System; including RCP Seal Injection	PRA input to the RAP
REACTOR COOLANT SYSTEMS	
Reactor Coolant System	PRA input to the RAP
FRONTLINE SAFETY SYSTEMS	
Combustible Gas Control System	PRA input to the RAP
Safety Injection System	PRA input to the RAP
In Containment Refueling Water Storage Tank	PRA input to the RAP
Severe Accident Heat Removal System	PRA input to the RAP
Extra Borating System	PRA input to the RAP
Emergency Feedwater System	PRA input to the RAP
STRUCTURES	
Emergency Power Generating Buildings	PRA input to the RAP
Nuclear Island Structural System (Reactor, Fuel, Safeguard Buildings)	PRA input to the RAP
Essential Service Water Pump Buildings	PRA input to the RAP
Essential Service Water Cooling Tower Structure	PRA input to the RAP
DISTRIBUTED UTILITIES	
Demineralized Water Distribution System	PRA input to the RAP
Seal Water Supply System	PRA input to the RAP
Component Cooling Water System	PRA input to the RAP
Essential Service Water System	PRA input to the RAP
Safety Chilled Water System	PRA input to the RAP
POWER CONVERSION SYSTEMS	
Feedwater System	PRA input to the RAP
Main Steam System	PRA input to the RAP
Steam Generator Blowdown System	PRA input to the RAP
HVAC SYSTEMS	
Containment Building Ventilation System	PRA input to the RAP
Annulus Ventilation System	PRA input to the RAP
Electrical Division of Safeguard Building Ventilation System	PRA input to the RAP
Safeguard Building Controlled Area Ventilation System	Added by expert panel
Fuel Building Ventilation System	Added by expert panel
Main Control Room Air Conditioning System	Added by expert panel
Emergency Power Generating Building Ventilation System	PRA input to the RAP
Station Blackout Building Ventilation System	PRA input to the RAP
Essential Service Water Pump Building Ventilation System	PRA input to the RAP
AUXILIARY SYSTEMS	
Liquid Waste Storage and Processing System	Added by expert panel
Gaseous Waste Processing System	Added by expert panel
Station Blackout Diesel Generator Set	PRA input to the RAP
Emergency Diesel Generator Set	PRA input to the RAP
ELECTRICAL SYSTEMS	
Offsite Power System	PRA input to the RAP
Class 1E Uninterruptible Power System	PRA input to the RAP
Emergency Power Supply System	PRA input to the RAP
Non-Class 1E Uninterruptible Power Supply System	PRA input to the RAP
Normal Power Supply System	PRA input to the RAP
12-Hour Uninterruptible Power Supply	PRA input to the RAP

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Table 17.4-2—Design Certification Scope Systems Included Within RAP

(Page 2 of 2)

System Name	Rationale for Selection
I&C SYSTEMS	
Boron Concentration Measurement System	Added by expert panel
Process Automation System	PRA input to the RAP
Process Information & Control System	PRA input to the RAP
Communication System	PRA input to the RAP
Safety Automation System	PRA input to the RAP
Safety Information & Control System	PRA input to the RAP
Main Control Room	PRA input to the RAP
Remote Shutdown Station	PRA input to the RAP
Incore Instrumentation System	PRA input to the RAP
Excore Instrumentation System	Added by expert panel
Radiation Monitoring System	Added by expert panel
Protection System	PRA input to the RAP
Priority & Actuator Control System	PRA input to the RAP
Reactor Control, Surveillance & Limitation System	PRA input to the RAP
Control Rod Drive Control System	PRA input to the RAP
Reactor Pressure Vessel Level Measurement System	Added by expert panel
Hydrogen Monitoring System	Added by expert panel
Turbine-Generator Instrumentation and Control	Added by expert panel
Leak Detection Systems	Added by expert panel

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Table 17.4-3—{Site Specific Systems Included Within RAP}

System Name	Qualitative Determination for System Addition
STRUCTURES	
Essential Service Water Makeup System Pumphouse	System failure modes may affect multiple trains/systems
Essential Service Water Emergency Makeup System Retention Pond	System failure modes may affect multiple trains/systems
Switchgear Building	System failure modes may affect multiple trains/systems (Station Blackout)
POWER CONVERSION SYSTEMS	
Feedwater Heating System	System contains components important to maintaining system reliability
DISTRIBUTED UTILITIES	
Essential Service Water Emergency Makeup System	Considered in design basis analysis;
	The system function is considered important in the Safety Analysis Report;
	A contribution to initiators;
	Technical Specification considerations
ELECTRICAL SYSTEMS	
Offsite Power System-partial (plant specific scope)	Contains components important to maintaining system reliability;
	System failure modes may affect multiple trains/systems;
	Technical Specification considerations
Switchyard	Contains components important to maintaining system reliability;
	System failure modes may affect multiple trains/systems;
	Technical Specification considerations

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17.5 QUALITY ASSURANCE PROGRAM DESCRIPTION

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

17.5.1 QA PROGRAM RESPONSIBILITIES

{The QA Program is established in the Bell Bend Quality Assurance Program Description (PPL Bell Bend LLC, COLA Part 11a). The Bell Bend QAPD incorporates Revision 0 of the UniStar Nuclear Energy QAPD (UniStar, 2007) in its entirety, with the following exceptions:

1. Throughout the QAPD, changes to reflect the Bell Bend organization in Section A (and title and description changes when appropriate).

2. Throughout the QAPD, adoption of PPL programs and processes, and deletion of Unistar programs and processes.

3. Introduction, change of a reference to CFR 50.2 versus 50.3 for definitions.

4. Introduction, modification of phrase from "Exceptions or alternatives to these documents that require NRC approval are documented in Table 1" to "Exceptions or alternatives to these documents are documented in Table 1".

5. Section A, changes eliminating differentiating between on-site versus off-site titles and organizations, and deletion of reference to off-site Bell Bend organizations.

6. Section D, addition of a phrase:

    a. Additionally 10 CFR 50.55 "Conditions of construction permits, early site permits, combined licenses, and manufacturing licenses," paragraph (e) is imposed on suppliers of QA Level 1 materials and services until approval of the operating license by the NRC in accordance with 10 CFR 52.103(g), "Operation under a combined license."

7. Section D, addition of a phrase regarding a requirement invoking NRC reporting requirements of 10 CFR 21:

    a. "and/or 10 CFR 50.55(e) for QA Level 1 procurements".

8. Section G, addition of a phrase taking exception to part of NQA-1 1994:

    a. Other 10 CFR 50 or 10 CFR 52 licensees, Authorized Nuclear Inspection Agencies, National Institute of Standards and Technology, or other State and Federal agencies that may provide items or services to PPL Bell Bend, LLC are not required to be evaluated or audited.

9. Section G, addition of "ACLASS Accreditation Services" as one of the acceptable laboratory administration programs for procurement of commercial -grade calibration services.

10. Section U reference changes:

    a. Commitment to RG 1.26 and 1.29 Rev 4 versus Rev 3.

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b. Commitment to RG 1.37, Rev 1, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants".

c. Commitment to GL 88-18, 10/20/88, "Plant Record Storage on Optical Discs".

11. Section V exceptions:

a. Modification of phrase from "important to safety" to "important to safety of the plant under postulated fire scenarios" in the "Quality Assurance Program" section.

b. Modification of phrase from "adverse to ATWS, SBO, and fire protection" to "adverse to proper functioning of ATWS, SBO, and fire protection systems" in the "Corrective Action" section.

c. Modification of the phrase "Administrative controls are limiting transient combustibles in areas important to safety" to "Administrative controls are limiting transient combustibles in areas that are important to safe operation of the plant" in the "Audits" section.

12. Appendix 1, corrected reference to 50.55(f)(4) from 50.55(f)(3).

13. Table 1, added item 2 regarding the PPL Bell Bend LLC, procurement program.

The Bell Bend QAPD is submitted in Part 11 of this COL Application. The Bell Bend QAPD is applicable to the siting, design, fabrication, construction (including pre-operational testing), operation (including testing), maintenance and modification of the facility. The Bell Bend QAPD conforms to the criteria established in 10 CFR 50, Appendix B, (CFR, 2008a). PPL Bell Bend, LLC commits to implement the:

- Basic Requirements and Supplements of ANSI/NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications," (ANSI, 1994) as described in the QAPD.

- Specific subparts of NQA-1-1994, as described in the QAPD.

PPL Bell Bend, LLC does not delegate any of the activities associated with planning, establishing, or implementing the overall QA program to others, and retains the responsibility for the program. PPL Bell Bend, LLC contracted with UniStar Nuclear Energy (UniStar) to develop the Bell Bend COL application, including site characterization activities. The process of developing the reference COL application sections was performed by UniStar under the UniStar QAPD. The process of collection, review and analysis of specific data for site characterization was performed under the UniStar QAPD.

PPL Bell Bend, LLC provided site-specific applicant input, review of COL application content, working directly with UniStar, AREVA, Sargent & Lundy, Rizzo, Black & Veatch and other contractors.

Revision 0 of UN-TR-06-001-A (UniStar, 2007) was approved by the NRC (NRC, 2007a) (NRC, 2007b). The Bell Bend QAPD is included in Part 11a of this COL application, and is incorporated by reference into the FSAR.}

Changes to the QAPD are accomplished in accordance with 10 CFR 50.54(a)(3) and 10 CFR 50.55(f)(4).

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17.5.2 SRP SECTION 17.5 AND THE QA PROGRAM DESCRIPTION

{The Bell Bend QAPD is applicable to the sitting, design, fabrication, construction (including pre-operational testing), operation (including testing), maintenance and modification of the facility. The Bell Bend QAPD is provided in Part 11 of this COL Application}.

This {Bell Bend} QAPD is incorporated by reference.

17.5.3 EVALUATION OF THE QAPD AGAINST THE SRP AND QAPD SUBMITTAL GUIDANCE

The UniStar Nuclear QAPD, as established in Revision 0 of UN-TR-06-001-A (UniStar, 2007), was approved by the NRC (NRC, 2007a)(NRC, 2007b) and conforms to the guidance provided in the NUREG-0800 (NRC, 2007c).

{The Bell Bend QAPD incorporates Revision 0 of the Unistar Nuclear QAPD with the exceptions described in section 17.5.1}.

17.5.4 REFERENCES

{**ANSI, 1994.** Quality Assurance Requirements for Nuclear Facility Applications, ANSI/NQA-1-1994, American National Standards Institute, 1994.

CFR, 2008a. Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, Title 10, Code of Federal Regulations, Part 50, Appendix B, U.S. Nuclear Regulatory Commission, 2008.

NRC, 2007a. Letter from L. J. Burkhart (NRC) to R. M. Krich (UniStar Nuclear), "Final Safety Evaluation for Topical Report (TR) UN-TR-06-0001, 'Quality Assurance Program Description' (Project No. 746), " dated March 14, 2007.

NRC 2007b. Letter from L. J. Burkhart (NRC) to R. M. Krich (UniStar Nuclear), "Replacement Pages for the Final Safety Evaluation for Topical Report (TR) UN-TR-06-0001, 'Quality Assurance Program Description' (Project No. 746), " dated March 16, 2007.

NRC, 2007c. Standard Review Plan 17.5, "Quality Assurance Program Description – Design Certification, Early Site Permit and New License Applicants, " NUREG-0800, Revision 0, U.S. Nuclear Regulatory Commission, March 2007.

UniStar, 2007. Letter from R. M. Krich (UniStar Nuclear) to the U.S. Nuclear Regulatory Commission, "UniStar Nuclear, NRC Project No. 746, Submittal of the Published UniStar Topical Report No. UN-TR-06-001-A, 'Quality Assurance Program Description, ' Revision 0, " dated April 9, 2007. }

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17.6 DESCRIPTION OF APPLICANT'S PROGRAM FOR IMPLEMENTATION OF 10 CFR 50.65, THE MAINTENANCE RULE

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Item in Section 17.6:

A COL applicant that references the U.S. EPR design certification will describe the program for Maintenance Rule implementation.

This COL Item is addressed as follows:

The Maintenance Rule Program description included in NEI 07-02A, "Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52," Revision 0, dated March 2008, (NEI, 2008) is incorporated by reference with supplements in Section 17.7.

17.6.1 SCOPING PER 10 CFR 50.65(b)

The U.S. EPR FSAR includes the following COL Item in Section 17.6.1:

A COL applicant that references the U.S. EPR design certification will describe the process for determining which plant structures, systems, and components (SSC) will be included in the scope of the Maintenance Rule Program in accordance with 10 CFR 50.65(b).

This COL Item is addressed as follows:

Maintenance rule scoping per 10 CFR 50.65(b) is described in Section 17.7.1.1.

17.6.2 MONITORING PER 10 CFR 50.65(a)

The U.S. EPR FSAR includes the following COL Item in Section 17.6.2:

A COL applicant referencing the U.S. EPR design certification will provide a program description for monitoring SSC in accordance with 10 CFR 50.65(a)(1).

This COL Item is addressed as follows:

Monitoring and corrective action per 10 CFR 50.65(a)(1) is described in Section 17.7.1.2.

The U.S. EPR FSAR includes the following COL Item in Section 17.6.2:

A COL applicant that references the U.S. EPR design certification will provide the process for determining which SSC within the scope of the Maintenance Rule Program will be tracked to demonstrate effective control of their performance or condition in accordance with paragraph 50.65(a)(2).

This COL Item is addressed as follows:

Preventative maintenance per 10 CFR 50.65(a)(2) is described in Section 17.7.1.3.

17.6.3 PERIODIC EVALUATION PER 10 CFR 50.65(a)(3)

The U.S. EPR FSAR includes the following COL Item in Section 17.6.3:

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A COL applicant that references the U.S. EPR design certification will identify and describe the program for periodic evaluation of the Maintenance Rule Program in accordance with 10 CFR 50.65(a)(3).

This COL Item is addressed as follows:

Periodic evaluation of monitoring and preventative maintenance per 10 CFR 50.65(a)(3) is described in Section 17.7.1.4.

17.6.4 RISK ASSESSMENT AND MANAGEMENT PER 10 CFR 50.65(a)(4)

The U.S. EPR FSAR includes the following COL Item in Section 17.6.4:

A COL applicant that references the U.S. EPR design certification will describe the program for maintenance risk assessment and management in accordance with 10 CFR 50.65(a)(4).

This COL Item is addressed as follows:

Risk assessment and risk management per 10 CFR 50.65(a)(4) is described in Section 17.7.1.5.

17.6.5 MAINTENANCE RULE TRAINING AND QUALIFICATION

The U.S. EPR FSAR includes the following COL Item in Section 17.6.5:

A COL applicant that references the U.S. EPR design certification will describe the program for selection, training, and qualification of personnel with Maintenance-Rule-related responsibilities consistent with the provisions of Section 13.2 as applicable.

This COL Item is addressed as follows:

Maintenance rule training and qualification is described in Section 17.7.2.

17.6.6 MAINTENANCE RULE PROGRAM ROLE IN IMPLEMENTATION OF RELIABILITY ASSURANCE PROGRAM (RAP) IN THE OPERATIONS PHASE

The U.S. EPR FSAR includes the following COL Item in Section 17.6.6:

A COL applicant referencing the U.S. EPR design certification will describe the relationship and interface between Maintenance Rule Program and the Reliability Assurance Program (refer to Section 17.4).

This COL Item is addressed as follows:

Maintenance rule program relationship with reliability assurance activities is described in Section 17.7.3.

17.6.7 MAINTENANCE RULE PROGRAM IMPLEMENTATION

The U.S. EPR FSAR includes the following COL Item in Section 17.6.7:

A COL applicant referencing the U.S. EPR design certification will describe the plan or process for implementing the Maintenance Rule Program as described in the COL application, which includes establishing program elements through sequence and

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milestones and monitoring or tracking the performance and/or condition of SSC as they become operational.

This COL Item is addressed as follows:

Maintenance rule program implementation is described in Section 17.7.5.

17.6.8 REFERENCES

{This section is added as a supplement to the U.S. EPR FSAR.

NEI, 2008. Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52, NEI 07-02A, Revision 0, Nuclear Energy Institute, March 2008.}

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17.7 Maintenance Rule Program

This section is added as a supplement to the U.S. EPR FSAR.

The Maintenance Rule Program description included in NEI 07-02A, "Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52," Revision 0, dated March 2008 is incorporated by reference. The text of the template provided in NEI 07-02A is generically numbered as "17.X." The template is incorporated by reference into this FSAR Section by changing the numbering from "17.X" to "17.7."

In Section 17.X.1.1.b of NEI 07-02A the "DRAP" (Reliability Assurance Program for the Design Phase) is defined to be located in FSAR "17.Y." The DRAP is included in Section 17.4. The template is incorporated by reference into this FSAR section by changing the numbering from "17.Y" to "17.4."

Descriptions of the programs listed in Subsection 17.X.3 of NEI 07-02A are provided in the following FSAR Chapters/Sections or Part 4:

- Maintenance rule program (Section 17.7).
- Quality assurance program (Section 17.5).
- Inservice inspection program (Sections 5.2 and 6.6).
- Inservice testing program (Section 3.9).
- Technical specifications surveillance test program (Part 4).
- Maintenance Programs (Section 13.5.2.2.6).

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