APPENDIX C: QUAD CITIES

CATEGORY A&B FACTS & OBSERVATION ITEMS [1]

[1] There are no "A" Facts & Observations

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element IE **Sub-element 5**

It may be beneficial to include the loss of one DC division as a separate initiator since even though it may not trip the plant, it would lead to a manual plant shutdown with degraded components if the DC division were not recovered.

The documentation states that this would be a low contributor to CDF based on the conditional core damage probability for the loss of feedwater events, but it would probably be best to verify this by including it as its own initiator to eliminate any uncertainty.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
Consider including loss of one division of DC as a special initiator with its own event tree development.

PLANT RESPONSE OR RESOLUTIONThis is a difficult event to classify. The loss of a single DC division does not cause a scram or turbine trip. Therefore, it logically is not included as a transient initiator. However, the Quad Cities Technical Specifications, Item 3.9.(E) - Distribution - Operating, p. 3/4.9-17 Action (2), specifies that if one of the required distribution systems are not energized, re-energize the system within 2 hours or be in hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours.

This would indicate that it is prudent to consider the loss of a DC bus and a demand to reach safe shutdown as part of the PRA. Therefore, this will be added to the list of initiators. It is found in other studies of BWRs that the common cause loss of DC buses, which is already included in the Quad Cities PRA, is by far the largest contributor to risk associated with DC bus unavailability.

Thus, no substantial change in the risk profile or the importance of SSCs is anticipated from the addition of the single DC bus "initiating event."

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element IE **Sub-element 14**

The on-line surveillance testing of interfacing system valves has not been included in the development of the ISLOCA initiating event frequency analysis. This could be a dominant contributor to the frequency analysis.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
Update the ISLOCA frequency analysis to include the surveillance test interval. Reference the methodology specified by NUREG/CR-5603 or NUREG/CR-5124.

PLANT RESPONSE OR RESOLUTION
A review of the latest Quad Cities Technical Specifications has been performed to identify the surveillance test interval for the Pressure Isolation Valves (PIVs) involved in the assessment of the ISLOCA contributors. The results of this evaluation indicate that these valves are leak tested and cycled every refueling. (See Section 3/4-7.) In addition, work control has identified that these tests are performed while the unit is shutdown. These results support a minimal impact on the ISLOCA frequency based on the NSAC-154, NUREG/CR-5603 and NUREG/CR-5124 evaluation guidelines.

The ISLOCA evaluation will be revised consistent with NSAC-154 guidelines to ensure that there are no other changes that may influence the ISLOCA frequency contribution to risk.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS

OBSERVATION

Element AS **Sub-element 14**

The end state for %DLOOP tree, DLOP-17, DLOP-20, DLOP-26 and DLOP-27 do not reflect the appropriate plant damage class (as indicated in the LOOP presentation by the utility.)

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

Update the end state classification to that presented to the PSA Cert. Team. (i.e., DLOP-17, DLOP-20 are IBL and DLOP-26, DLOP-27 are IBE.)

PLANT RESPONSE OR RESOLUTION

This is a documentation item. The event tree figure and documentation will be updated to reflect this modification. However, the change has no impact on the quantitative results. The Level 1 and Level 2 computer model and its results reflect the appropriate plant damage class. Therefore, the quantification of the risk and its contributors is accurate as is.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element TH **Sub-element 10**

There is conflicting information regarding the need for room cooling for RCIC. Calculation BSA-Q-97-04 seems to indicate that it is not required, but BSA-Q-96-01 would indicate that it is required. (See QC-PSA-006, Note 4 to Table 2-12)

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
Clarify whether room cooling is needed for RCIC, and factor the appropriate finding into the model.

PLANT RESPONSE OR RESOLUTION

There is no conflict in the Quad Cities documentation. The two calculations clearly state when there is a need for room cooling.

RCIC room cooling is only required in the event of a gland seal leakoff failure. This is modeled in the PSA and is supported by calculation BSA-Q-97-04. Gland seal leakoff failure is modeled probabilistically. The RCIC room coolers may be required if both RCIC and Core Spray (which are co-located) are operating at the same time (see calculation BSA-Q-96-01). However, no accident sequences require simultaneous RCIC and CS operating. The operator would terminate CS because it is not required. Therefore, the RCIC room cooling is found to be appropriately modeled.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element TH Sub-element 12

The success criteria notebook (QC-PSA-003) documents the ATWS criteria in Tables 3-1b. However, the success criteria description or supporting text has not been provided. This makes it difficult to trace the bases for the ATWS success criteria.

Subsequent to this observation, written description of ATWS success criteria (draft) was provided to the Certification team. The write-up is and the success criteria tables are slightly inconsistent in terms of the need for FW Trip or runback. It appears that based on new information, the PRA team has decided that FW trip is not required. The success criteria Tables still indicate that FW runback is needed. It is not clear how this issue was modeled in the PRA. ***LEVEL OF SIGNIFICANCE***B ***POSSIBLE RESOLUTION***Revise the success criteria tables to match with the draft write-up on ATWS success criteria and check the PRA modeling is consistent with the success criteria. ***PLANT RESPONSE OR RESOLUTION***The modeling assumptions made in the success criteria documentation is reflective of a BWR with limited SRV/SV capacity such as Pilgrim (less than 50% of full power steam flow). This is such that even with successful RPT, the RPV pressure will continue to rise over the 1 to 2 minute time frame following an MSIV closure isolation. The Quad Cities plant has substantial combined SRV/SV capacity (more than 70% of full power steam flow); and therefore it is found that there is no need for a FW pump trip to prevent overpressure failure as long as RPT is successful. As a result, the current PRA model is slightly conservative because it introduces a failure mode that has been assessed as inapplicable to Quad Cities. The ATWS model is slightly conservative in the existing model used for the Option 2 analysis; however, the assumed failure results in an insignificant numerical impact. Therefore, the decision-making input from the PRA is unaffected.

The excess discussion of the ATWS success criteria and the associated tables will be modified in the PRA documentation (QC-PSA-003) to reflect the above information and to remove the excess conservatism in the model.

The overpressure effect of continuing FW (motor driven) injection under ATWS conditions has been found to be acceptable. The model does not require FW trip to ensure success for ATWS events with ARI failure.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element SY **Sub-element 6**

Various piping attached to the CCSTs (i.e. RCIC suction line) is not protected against inadvertent collision with forklifts or other small vehicles. The presence of a vehicle and tire tracks indicate that this is a real probability. This is a vulnerability that could cause a common cause failure of the CST and suction source for several systems.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTIONStrongly suggest to station personnel that a vehicle barrier is important to prevent the potential issue from occurring. If this is not possible, include the vulnerability in the PSA model.

PLANT RESPONSE OR RESOLUTION

The suggestion is considered a viable insight and has been included in the PRA insights.

The identified event is not an initiating event, and its coincidental failure within the 24 hour mission time of an accident mitigation is considered to be probabilistically insignificant.

Mitigation is approximately 1E-3

CDF ~ 8E-10/yr

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element SY **Sub-element 26**

There is a procedure that requires PSA Engineering to be interfaced with for changes made to the plant. There is not a procedural requirement to include PSA Engineering in the changes made to procedures, surveillances, instructions, etc. that could affect the CDF.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

To maintain the quality of the model, make a procedural requirement that includes PSA Engineering in the review process.

PLANT RESPONSE OR RESOLUTION

The On-Site Risk Management Engineer monitors the on-going changes to the plant, procedures, surveillances, and instructions. These are part of the periodic PRA update. A continuous monitoring of these changes is not considered consistent with the recognized periodic PSA update process that is being implemented throughout the industry.

As part of the Option 2 Pilot PRA application, the Quad Cities Risk Management Engineer reviewed changes to the plant since the update freeze date and confirmed that one plant modification has been made that would influence the calculations. The modification reduced the importance of FW SSCs.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element DA **Sub-element 6**

The component probabilities data used in the evaluation are based on accumulated plant specific experience. However, the last three years experience has not been included in the accumulated data.

LEVEL OF SIGNIFICANCE:

B

POSSIBLE RESOLUTIONThese data should be updated on a continuing basis

PLANT RESPONSE OR RESOLUTION
The next periodic update will include the incorporation of plant specific maintenance rule data. In the meantime, a check of the data indicates that the only SSC that have operating experience showing higher unavailability than accounted for is the PRA in the HPCI system.

The impact on the PSA is that….

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element HR **Sub-element 14**

The Human Reliability Analysis relied on the analysts' review and interpretation of the QGAs and other procedures. A major enhancement to the scrutability of the analysis would be to factor a structured interview or question process into the analysis and documentation. This could also help to support the cases where execution time was estimated.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
Prepare operator interviews or question sets to verify that the QGA interpretation was done appropriately for the dominant HEPs in the model.

PLANT RESPONSE OR RESOLUTION
The operator interview questions and results were not available to the PRA Peer Review Team at the time of their review. The operating crew interviews performed to support the HRA included a structured set of questions, the answers to which were used in the evaluation of each of the HEPs in the model. The results of the information gained from the interview process is included in the updated HRA analysis, Section 3. This documentation item is considered resolved. The addition of the documentation to the HRA document did not alter the risk profile.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element DE **Sub-element 9**

Flooding is an important issue that merits further investigation by the Quad Cities PSA staff. At least two potential vulnerabilities exist at the Quad Cities Station in respect to internal flooding. 1) A rubber boot secured by hose clamps on the RCIC suction line (torus room side). 2) Ventilation penetrations below the maximum postulated torus room flood zone.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
1) According to the system engineer surveillance with a cyclic frequency exists that queues him to perform a walkdown of the torus room. PSA group might want to validate that the rubber boot seal has some pedigree to ensure that it remains functional as long as it is installed.

2) The ventilation ductwork within the core spray room is stepped up such that the top is above the maximum postulated flood level of the torus room. The PSA group should consider ensuring a calculation has been performed validating the ductwork can support the weight of the water without collapsing and thereby flooding the pump room.

PLANT RESPONSE OR RESOLUTIONAs suggested, internal flooding has been the subject of an on-going update. The internal flood evaluation will then be incorporated into the PRA. The two specific items cited in the Peer Review comment have been investigated as part of the internal flood update, and it is found that they contribute a negligible degree to the CDF and LERF.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTSOBSERVATION

Element DE Sub-element 10

The lack of documented walkdowns provides for a level of uncertainty.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

Consider performing a detailed walkdown of the Quad Cities Generating Station of all areas modeled in the PSA. Recommend involving an individual with a strong knowledge of the Station to augment the two relatively new PSA Engineers in performance of their walkdown.

PLANT RESPONSE OR RESOLUTION

The Observation addresses a documentation issue related to the walkdowns performed on the Quad Cities plant. Currently, although multiple walkdowns were performed, no walkdown notes are available except those developed as part of:

(a) the internal flood walkdowns in 1992 and 2001
(b) the RI-ISI project
(c) the fire events PRA Update.

The dependency analysis itself was not criticized and is judged by Exelon to be at the state-of-the-technology. The incorporation of walkdown notes would further enhance the dependency documentation but is not believed to affect the model quantification.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element QU Sub-element 8

In the top 100 sequences, cutset 96 is an ATWS scenario with mechanical scram failure, following loss of feedwater event. Core damage occurs when operator fails to inhibit ADS due to low water level. The HEP credited is for "failure to inhibit ADS w/feedwater injecting." This HEP appears to be misapplied for this sequence, since loss of feedwater is the initiator.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

The ATWS event tree and flag settings should be reviewed for adequacy for this sequence. A proper HEP should be applied to this sequence.

PLANT RESPONSE OR RESOLUTION

ADS inhibit during ATWS events is modeled with two HEPs as follows:

ADS inhibit with FW initially available (event 1ADOP-INHIBHPH--; HEP = 1.4E-2)

ADS inhibit will FW unavailable (event 1APOPINHIBIT-H--; HEP = 3.4E-2)

This anomaly is related to the use of the ONE4ALL model. Cutset 96 is a non-minimal cutset that should be removed from the model. Cutset 44 provides a similar scenario with FW unavailable and uses the appropriate HEP of 3.4E-2. Therefore, the current model provides conservative results. However, the quantitative impact is judged to be minor (less than 1%). The model, flag files, and mutually exclusive files, should be reviewed to ensure that for sequences with FW failure, additional cutsets with ADS inhibit for FW success are not included in the final cutsets. In addition, the ONE4ALL model should be updated to explicitly account for all event tree success paths. This will eliminate the potential for including HEPs for FW success even though FW previously failed.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element QU Sub-element 15

It is not clear that the EDGs (i.e. the non-SBO diesels) would have sufficient capacity to allow for RHR and RHRSW pumps to be running for both units in the dual loss of offsite power scenario.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
The success criteria given one non-SBO diesel available in the dual unit loop case should be examined to ensure it is appropriately captured in the model.

PLANT RESPONSE OR RESOLUTION
The EDG capacity is 2850 kw rated (2000 hrs/yr). The load for SBO Response on 2 units with RHR and RHRSW pumps is 1290 kw/unit = 2580 kw total. Therefore a single EDG could carry the RHR/RHRSW loads of both units. Alternatively, the loads do not need to be continuously present but rather could be switched back and forth as necessary to maintain plant conditions. Quad Cities has a procedure to allow powering both units for safe shutdown from the swing EDG-- QCOA 6100-03 (Rev 9).

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element QU **Sub-element 26**

An uncertainty analysis was not performed as part of the evaluation of the model results.
LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
An uncertainty analysis is an important part of evaluating the model. The capability to perform such an analysis may be required for certain risk-informed requests in the future. It may also be beneficial to include the need to perform an uncertainty analysis in the maintenance and update procedure.
PLANT RESPONSE OR RESOLUTION
An uncertainty evaluation was performed in response to this F&O. The evaluation references the parametric uncertainty analysis performed on similar plants and reviews the types of uncertainty along with the practical insights to be derived from the uncertainty analysis.

See the Uncertainty Evaluation for the results.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element QU **Sub-element 26**

No special sensitivity or uncertainty cases have been performed. Typically sensitivity studies accompany the dominant sequences, initiators or other modeling feature (such as vessel rupture initiating event) which may dominate the uncertainty of the CDF point estimate of CDF. This information is needed to establish the acceptability of the final results.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

To establish reasonableness of the model development and methodology employed, sensitivity and uncertainty assessments should be performed.

PLANT RESPONSE OR RESOLUTION

Sensitively evaluations were performed in response to this F&O. See the Uncertainty Evaluation for the results.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element L2 **Sub-element 7, 13**

The transfer from L1 to L2 PRA is done by carrying the plant damage state frequencies. The dependency of systems examined in the L2 PRA on the support systems that might have been disabled in the L1 PRA cannot be accounted for accurately.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION Carry the support system dependency from L1 PRA to L2 PRA in the next revision.

PLANT RESPONSE OR RESOLUTION
The current conditional LERF probability is close to 0.7. The system dependencies are overwhelmed by the conservative treatment of the Level 2 phenomenological dependencies.

Incorporation of a more realistic assessment, including the incorporation of the Level 1 dependencies in a less conservative manner would result in reducing the LERF frequency and LERF conditional probability.

(See L2, 7, 20)

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element L2 Sub-element 7, 20

The Level 2 evaluation is not directly linked with the Level 1 results. Instead, LERF multipliers are applied to each of the sequences from the Level 1. A more detailed linking approach may be desirable, especially with the currently high conditional LERF value of (~0.7 with Class 2 events included, ~0.4 without Class 2 events included). The conservatisms included by not directly linking the cutsets may be severely limiting for intended applications.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTION
Consider linking the Level 1 directly into the Level 2 evaluation.

PLANT RESPONSE OR RESOLUTION
The LERF model is recognized as conservative and potentially limiting for certain applications.

It has not been limiting for the Option 2 PSA evaluation.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element L2 Sub-element 24

The simplified approach of focusing only of LERF sequences by using factors simplifies the approach significantly and possibly makes it conservative. Because of this simplification, the approach may be too conservative for Risk-informed applications.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTIONPerform a more detailed L2 PSA.

PLANT RESPONSE OR RESOLUTION
See L2-7, 13 and L2-7, 20.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element MU Sub-element 1, 3

The existing guidance in NEP-17-04 is at a programmatic, conceptual level. There are very few working level documents in place to allow the update team to perform PSA updates without relying solely on the "skill of the craft".

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

Develop working level procedures for each step in the update process. Pay special attention to the steps performed by plant personnel, especially those outside engineering.

PLANT RESPONSE OR RESOLUTION

The Exelon PRA Programs have been drawn together with a single focal point, Dr. W.E. Burchill. Under his leadership, the Exelon PRAs and the programmatic directions are being updated and upgraded.

At the time of the Quad Cities PRA Peer Review, the PRA Program guidance and procedures were in the final stages of completion. The PRA Peer Review Team did not review either the upgraded program procedures or their implementation.

Approximately, one year later, the Dresden PRA received a PRA Peer Review. This Peer Review Team had access to the updated Exelon program procedures and guidance, i.e., the same guidance that is now used for Quad Cities.

The results of the PRA Peer Review of the Maintenance and Update Program for Dresden (identical to that now in force for Quad Cities) were the following:

The grades were all 3 and 4 except one 2 related to in-house independence of the checker
An overall grade of 3 was assigned to the Maintenance and Update Element consistent with the Option 2 expectation
No Fact and Observations were identified for Dresden
Qualitatively, the Team stated:

> *The guidance for model maintenance and update at Dresden is superior. Inputs for the MU process are described in Dresden procedure ER-AA-600. Changes that impact the PRA model are tracked in a computerized database. This is a superior practice.*

> *Computer program update and maintenance is controlled by procedures. Training is performed after PRA updates, but not necessarily on software revisions. A list of applications to be re-evaluated is contained in a computerized database. This is a superior practice.*

Based on the Dresden PRA Peer Review results and similar results for the Byron and Braidwood PRA Peer Reviews, it is judged that the Maintenance and Update process at Exelon is superior and that the Quad Cities F&Os are resolved by virtue of the subsequent program changes and implementation efforts.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS

OBSERVATION

Element MU **Sub-element 4**

Enhance the data collection phase of the update process to include the following elements that the "Monitoring and Collecting New Information" sub-element suggested was missing from the update procedure:

Operating experience
New maintenance policies
Operator Training Program
Emergency Plan changes
Accident Management Programs
Industry Studies

Especially important in this process will be the true integration of the system engineers and operations personnel into the update process.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

Include the review elements listed above in the model update procedure and the implementing procedures for NEP-17-04's high level guidance.

PLANT RESPONSE OR RESOLUTION

This is resolved—see MU 1,3 resolution but the following have not yet been included:

Industry studies

Operator training programs

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element MU **Sub-element 6**

The update of PSA model files is mentioned in NEP-17-04, but the control of these models is not addressed. The control of the FORTE and EOOS codes have been addressed in draft form to comply with NSP-CC-3021, but the is no guidance for the safeguard of the PSA model files.

PSA models and sensitivity studies are not stored in a controlled manner, and the official copies of the PSA models are limited to those available on the analyst's personal computer's hard drive and floppy disk box. These two storage locations do not provide the safeguards needed to ensure model fidelity.

LEVEL OF SIGNIFICANCE
B

POSSIBLE RESOLUTIONGuidance need to be provided which requires the designation of a "pristine" copy of the official model, to be stored in a controlled manner. Controlled storage options include offsite storage of the model on magnetic media, backup on computer network drives with special controls requiring special "keys" involving Information Services personnel, or non-re-writeable CD ROMs.

PLANT RESPONSE OR RESOLUTION
Currently the models are stored in at least three separate locations. This is not considered to practically affect the technical assessments of current or future applications. (See also Response to MU 1,3)

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element MU Sub-elements 7, 11

Section 5.2.2 of NEP-17-04 describes the periodic update process. The following findings apply to this section of the process.

Because this is a new procedure, the results of the use of this procedure cannot be reviewed. However, the elements of the process outlined can be compared to the certification criteria.

There are three aspects of the update process that are not adequately addressed. The first is the re-evaluation of Past PSA applications. The procedure briefly mentions that past PSA applications should be reviewed and updated as appropriate. This needs to be strengthened, especially if past PSA applications have served as the bases for risk informed Tech Spec or licensing basis submittals. It is vital to determine if PSA model changes will invalidate the bases for submittals made to the NRC.

The second aspect is uncertainty analysis. The update procedure is silent on the need to do uncertainty analyses for PSA model and results update. The reviewers have noted that in order to be successful with risk informed applications in the future, uncertainty needs to be addressed.

The third aspect is handling of the insights from the update, especially in terms of identification of vulnerabilities and enhancements. Detailed guidance is needed for the identification of vulnerabilities discovered during the update process, as well as enhancements for station procedures and other plant programs such as the emergency plan.
LEVEL OF SIGNIFICANCE*B *POSSIBLE RESOLUTION PLANT RESPONSE OR RESOLUTIONSee Response to MU 1,3.

The Program now includes:

Re-evaluation of past PRA applications.

In addition, the implementation of the Plan has resulted in a precedence set for each plant of a Risk Insights document that compiles the practical insights found during the PRA that can be implemented. A definition of "vulnerability" has not been established. This is not considered necessary.

Finally an uncertainty analysis has been prepared for Quad Cities. This analysis is an addendum to the Quantification Notebook (QC-PSA-014).

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS

OBSERVATION

Element MU **Sub-element 9**

Procedure NEP-17-04, as it is written, does not meet the intent of this sub-element to have knowledgeable people review the results of the analysis. Particularly lacking is the input from Operations, Operator Training, and possibly from outside industry experts.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

The update procedure could call for the formation of an expert panel, consisting of PSA, operations, operator training, systems engineering, maintenance rule, and possibly outside PSA industry expertise to review the results of the PSA update.

PLANT RESPONSE OR RESOLUTION

See Response to MU 1,3.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION

Element MU **Sub-element 12**

This F&O addresses the deficiencies observed in the Maintenance and Update Process seen at the Downer's Grove corporate offices.

Commonwealth Edison wrote NEP-17-04 to codify the PSA Maintenance and Update Process for the entire Nuclear Operations Division. As of this Certification visit, this procedure has not been implemented for the Quad Cities PSA, and is only beginning to be implemented for the PSA Group.

The following are observations that pertain to activities performed solely at the corporate offices. They are listed by the steps in NEP-17-04 that apply.

5.1.1.3 The PSA supervisor/designee does not maintain a historical record of PSA updates
5.1.1.4 The supervisor/designee does not maintain an approved listing of the proper software/code for PSA application. The corporate offices do, however, abide by the requirements of NSP-CC-3021 for control of software codes, but this applies only to the EOOS/OSPRE codes that are run from the LAN/WAN.
5.1.1.5 The supervisor/designee does not maintain a record of the qualification of personnel assigned to the update tasks.
5.1.2.2 The PSA analysts are not performing the analysis of plant changes for the Quad Cities PSA model.
5.1.2.4 The PSA analysts are not reviewing the NFS calculation logs on a quarterly basis.
LEVEL OF SIGNIFICANCEB ***POSSIBLE RESOLUTION***The corporate office needs to begin to implement the procedure as written (with enhancements suggested by this certification) and complement it with detailed implementing procedures for the elements of the update and maintenance process. ***PLANT RESPONSE OR RESOLUTION***This has been completed (see ER-AA-600).

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION
Element MU Sub-element 12, 13

Commonwealth Edison wrote NEP-17-04 to codify the PSA Maintenance and Update Process for the entire Nuclear Operations Division. As of this Certification visit, this procedure has not been implemented for the Quad Cities PSA, and is only beginning to be implemented for the PSA Group.

The following are observations that pertain to activities performed at the sites. They are listed by the steps in NEP-17-04 that apply.

5.1.3.1 The Quad Cities site PSA analyst is not actively involved with the PSA updates as part of the update team.
5.1.3.2 The Quad Cities site PSA analyst does not perform independent reviews of PSA updates performed for other stations.
5.1.3.4/ 5.2.3.3 The Quad Cities site PSA analyst does not review the site calculation logs on a quarterly basis for impacts to the PSA model.
5.1.5.1 The system engineers do not receive training on the PSA, and therefore cannot be held responsible for being knowledgeable for information contained in the PSA system notebooks.
5.1.5.2 The system engineers (or the designees) do not receive training on the PSA, and therefore cannot be held responsible for considering the impact of the PSA model when the system engineer initiates or is made aware of plant changes.
5.1.6.1 The procedure writers, operating procedure/policy reviewers, and EOP writers do not receive training on the PSA, and therefore cannot be held responsible for considering the impact of procedure or policy changes on the PSA model.

The lack of quality input from the plant prevents the kind of independent review expected in element MU-13. ***LEVEL OF SIGNIFICANCE***B ***POSSIBLE RESOLUTION PLANT RESPONSE OR RESOLUTION***This procedure is currently being revised, but the current procedure or changes do not influence the on-going applications. Future PRA updates could be affected by the final resolution of these procedures.

FACT/OBSERVATION REGARDING
PSA TECHNICAL ELEMENTS
OBSERVATION **Element MU Sub-element 12**

The PRA engineer is automatically not in the loop for changes to plant procedures and Technical specifications that could impact the PRA results. It appears that PRA engineer is consulted on plant modifications, though it is not clear that there is a formalized procedure for this.

LEVEL OF SIGNIFICANCE

B

POSSIBLE RESOLUTION

PLANT RESPONSE OR RESOLUTION

The on-site PRA engineer is familiar with plant hardware, procedural, and Technical Specification changes. These changes are factored into the PRA on a periodic update basis. Other more extraordinary measures are not considered warranted.