

**From:** Lawrence Rossbach  
**To:** Allan.haeger@Exeloncorp.com  
**Date:** 5/21/01 5:42PM  
**Subject:** EPU Rad Consequences questions

Our review of the extended power uprate amendment requests has identified several questions in the radiological consequences area. They are enclosed as an attachment for Dresden and an attachment for Quad Cities. Please let me know if you would like a call to discuss them.

**CC:** Anthony Mendiola; Stewart Bailey

*Docket Nos. 50-237, 50-249, 50-254, 50-265*

DRESDEN EXTENDED POWER UPRATE  
REQUEST FOR ADDITIONAL INFORMATION - RADIOLOGICAL CONSEQUENCES

The ComED application cites Section 5.4 of the ELTR1, which states that the uprate application will provide justification that current radiological consequences are still bounding and within applicable criteria, or provide re-analysis of any areas adversely affected by power uprate. Appendix H of the ELTR1 describes the methodology and assumptions for these re-analyses. Appendix H does not provide specific assumptions, noting only that the analyses will be based on the methodology, assumptions, and analytical techniques described in the regulatory guides, the SRP, and previous safety evaluations. The staff's SER on ELTR1 dtd September 14, 1998, notes that radiological consequences will be assessed on a plant-specific basis using NRC-approved methods.

Section 9.3 of the safety analysis report for the Dresden 2 & 3 EPU addresses the radiological consequences of design basis accidents. While this section identifies the magnitude of change in the results, the application does not adequately identify the methodology, assumptions, and inputs used by ComEd in arriving at these conclusions. This information is necessary for the staff to determine whether the ComEd analyses are acceptable and meet the provisions of the ELTR1 and the staff SER on the ELTR1. Please provide the following additional information, or provide a cross-reference to where the information can be found in docketed material.

1. For any conclusion provided in this section that was derived in total or in part from generic analyses, please describe the analysis or provide a citation to that description. Please explain how the results were determined to be applicable to the Dresden 2 & 3 design basis as modified by this uprate.
2. If any of the accident dose results were obtained by plant-specific re-analysis, as opposed to scaling previous FSAR results, please provide a tabulation of analysis inputs and assumptions that will enable the staff to evaluate the acceptability of these assumptions, and as necessary, perform confirming calculations. Please identify any changes to prior design basis analysis inputs, assumptions, and methodologies, including offsite and control room atmospheric dispersion coefficients, incorporated in these re-analyses.
3. The application reports that the LOCA, CRDA, and FHA offsite thyroid and whole body doses for the increased by 26 percent and 17% respectively. This suggests that these results were obtained by multiplying the previous doses by a factor based on the increase in core inventory. This methodology is generally acceptable. However, the requested power uprate is only 17 percent. The application implies that the lack of proportionality might be due to the difference in U-235 and Pu-239 fission yields. However, ORIGEN data available to the staff (NUREG/CR-6703) indicates that the inventory of I-131 (Ci/MWt) increases by less than 2% from 22 to 75 GWD/MTU. Please explain the derivation of the 26% and 17% factors providing sufficient information for the staff to confirm the acceptability of these factors. Similarly, please explain why the control room factors for the LOCA differ from the factors used for the other accidents. If analyses were performed to derive the 26% and 17% factors, please describe the inputs, assumptions, and methodologies used.

4. Have any UFSAR or CURRENT results in Tables 9-7 through 9-8 been revised as a result of any analysis changes since this application was docketed?
5. In Table 9-7, please explain the difference between the "UFSAR" and "CURRENT" values tabulated for the control room thyroid dose. Please explain why only the control room thyroid dose changed.
6. Section 15.6.5.5.2 of the FSAR discusses the control room infiltration rates for Dresden. An earlier submittal dated May 19, 1997, subsequently withdrawn, indicated that the in-leakage measured with tracer gas testing shows that the observed leakage was less than the calculated leakage. Please confirm that this conclusion is still valid.
7. Section 4.7 identifies that the time to reach the oxygen limit decreases from 25 hours for pre-EPU to 19 hours EPU. Does this observation affect any analysis assumption regarding the dose impacts of the operation of the CAD system post-LOCA? If so, please describe how this was considered in determining the LOCA dose.

QUAD CITIES EXTENDED POWER UPRATE  
REQUEST FOR ADDITIONAL INFORMATION - RADIOLOGICAL CONSEQUENCES

The ComED application cites Section 5.4 of the ELTR1, which states that the uprate application will provide justification that current radiological consequences are still bounding and within applicable criteria, or provide re-analysis of any areas adversely affected by power uprate. Appendix H of the ELTR1 describes the methodology and assumptions for these re-analyses. Appendix H does not provide specific assumptions, noting only that the analyses will be based on the methodology, assumptions, and analytical techniques described in the regulatory guides, the SRP, and previous safety evaluations. The staff's SER on ELTR1 dtd September 14, 1998, notes that radiological consequences will be assessed on a plant-specific basis using NRC-approved methods.

Section 9.3 of the safety analysis report for the Quad Cities 1 & 2 EPU addresses the radiological consequences of design basis accidents. While this section identifies the magnitude of change in the results, the application does not adequately identify the methodology, assumptions, and inputs used by ComEd in arriving at these conclusions. This information is necessary for the staff to determine whether the ComEd analyses are acceptable and meet the provisions of the ELTR1 and the staff SER on the ELTR1. Please provide the following additional information, or provide a cross-reference to where the information can be found in docketed material.

1. For any conclusion provided in this section that was derived in total or in part from generic analyses, please describe the analysis or provide a citation to that description. Please explain how the results were determined to be applicable to the Quad Cities design basis as modified by this uprate.
2. If any of the accident dose results were obtained by plant-specific re-analysis, as opposed to scaling previous FSAR results, please provide a tabulation of analysis inputs and assumptions that will enable the staff to evaluate the acceptability of these assumptions, and as necessary, perform confirming calculations. Please identify any changes to prior design basis analysis inputs, assumptions, and methodologies, including offsite and control room atmospheric dispersion coefficients, incorporated in these re-analyses.
3. The application reports that the LOCA, CRDA, and FHA offsite thyroid and whole body doses for the increased by 27 percent and 18% respectively. This suggests that these results were obtained by multiplying the previous doses by a factor based on the increase in core inventory. This methodology is generally acceptable. However, the requested power uprate is only 17 percent. The application implies that the lack of proportionality might be due to the difference in U-235 and Pu-239 fission yields. However, ORIGEN data available to the staff (NUREG/CR-6703) indicates that the inventory of I-131 (Ci/MWt) increases by less than 2% from 22 to 75 GWD/MTU. Please explain the derivation of the 27% and 18% factors providing sufficient information for the staff to confirm the acceptability of these factors. Similarly, please explain why the control room factors for the LOCA differ from the factors used for the other accidents. If analyses were performed to derive the 27% and 18% factors, please describe the inputs, assumptions, and methodologies used.

4. Have any UFSAR or CURRENT results in Tables 9-7 through 9-8 been revised as a result of any analysis changes since this application was docketed?
5. In Table 9-7, please explain the difference between the "UFSAR" and "CURRENT" values tabulated for the control room thyroid dose. Please explain why only the control room thyroid dose changed.
6. Section 15.6.5.5.3.3 of the FSAR discusses the control room infiltration rates for Quad Cities. An earlier submittal dated May 19, 1997, subsequently withdrawn, indicated that the in-leakage measured with tracer gas testing shows that the observed leakage was less than the calculated leakage. Please confirm that this conclusion is still valid.
7. Section 4.7 identifies that the time to reach the oxygen limit decreases from 25 hours for pre-EPU to 19 hours EPU. Does this observation affect any analysis assumption regarding the dose impacts of the operation of the CAD system post-LOCA? If so, please describe how this was considered in determining the LOCA dose.