

April 13, 2006

Request for Additional Information

Quad Cities Unit 2 Dryer Inspection, Start-up and Power Ascension Plan

1. Please provide the following information to the NRC staff:

- (a) the steam dryer inspection results and analysis, including metallurgical reports;
- (b) the steam dryer failure root cause report;
- (c) the steam dryer stress analysis report;
- (d) licensee's justification for the steam dryer repair, including the extent of the repair, impact of the repair on steam dryer structural characteristics, and evaluation of remaining steam dryer, and
- (e) the licensee's description, analysis, and justification for the ERV modification in support of EPU operation, including evaluation of the shaker table test failure?

The NRC staff would like to have sufficient time to review these documents prior to Quad Cities Unit 2 startup.

2. Please provide the following information to the NRC:

MSL strain gage and accelerometer data, and walkdown information, during the power ascension.

The NRC staff would like to have sufficient time to review the data to determine if any safety concerns exist with continued power ascension.

3. In the Quad Cities Unit 2 Power Ascension Test Procedure TIC-1402, what is the power ascension intervals for Test Condition steps and hold times above OLTP (TC 12 to 18)?

4. Provide the basis for the vibration acceptance criteria for Levels 1 and 2 in Attachment 9.2 of TIC-1402.

5. Provide the basis for the MSL strain gage data acceptance criteria for Levels 1 and 2 in Attachment 9.3 of TIC-1402.

6. Provide the scope and objectives of the walkdowns that are planned at specific Test Condition steps.

7. Provide the basis and justification for remaining at the EPU power level while resolving the uncertainties surrounding the structural capability of the steam dryer and ERVs under EPU conditions.

8. Provide the extent of and the justification for leaving the small cracks in service during operation, especially at EPU.
9. For the large dryer crack in the skirt base metal at 135-degree location, provide the following information and documentation supporting your responses.
 - (a) What may be the magnitude of plastic strains and residual stresses introduced by the reported installation difficulty?
 - (b) What may be the corresponding reduction in the fatigue stress limits?
 - (c) What may be the stresses acting at the crack location?
 - (d) What is the stress intensity at the crack tip?
10. In the stress analysis submitted by Exelon in August 2005 (Report # GENE-0000-0043-5391-01-P), the maximum stress intensity in the skirt was high (24,285 psi) when 2% damping was assumed. Then damping in the skirt was increased to 4% and the corresponding maximum stress intensity was reduced to about 9,000 psi. Explain whether the damping in the skirt could be lower than 4% and what may be the role of resulting higher stresses in causing the large dryer crack?
11. Explain why some small fatigue cracks in several vane assemblies are not repaired. Did initial installation introduce any residual stress at the crack locations? What may be the magnitude of this stress? What may be the driving force for these cracks? How does this driving force compare with the one acting on the large crack at 135-degree location? How much these small cracks may grow during the next fuel cycle?
12. Are the MSL strain gage data at 2957 MWt available? How does this data compare with the corresponding data at 2,885 MWt and at pre-EPU condition? Provide similar comparison for RPV level sensor data.
13. What may be the magnitude of the weld residual stresses at the repaired crack location? What may be the effect of these residual stresses on the fatigue stress limits? Explain why the repaired crack location may not be susceptible to fatigue cracking?
14. Address how the magnitude of residual stresses created as a result of highly constrained weld repair is determined. How do these residual stresses affect the fatigue life for the material?
15. Discuss the potential for loose parts resulting from the failure of the backing bar.