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Chief, Rules and Directives Branch  
Division of Administrative Services  
Office of Administration  
Mail Stop T-6D 59  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Sir or Madam,

The Illinois Emergency Management Agency (IEMA) appreciates the opportunity to comment on Supplement 16 to NUREG-1437, the draft environmental impact statement concerning the application for Plant Life Extension (PLEX) at the Quad Cities (QC) site. We have two separate but related issues concerning the application. One directly concerns Supplement 16, the other is more safety analysis related. But because the two are related we will include both in these comments. The two issues are collective occupational radiation exposure, and the condition of steam dryers in both reactors.

Occupational radiation exposure is covered in section 4.6.3 of the generic environmental impact statement (GEIS), NUREG-1437. In this section, NRC evaluates the impact on occupational exposure during the renewal term. They examined baseline trends in cumulative occupational exposure, and the projected increments to occupational dose due to plant aging. The projections were compared with dose levels then being experienced to estimate accumulated dose and spontaneous cancer risk. Table 4.10 indicates that average individual dose rates between 1973-1989 decreased from a ~850 mrem to ~360 mrem at boiling water reactors. This indicates a significant and desirable downward trend. These levels are also well below the 5 rem/year 10CFR20 individual dose limit. The GEIS states that as plants age, there will be a slight increase in radioactive inventories, resulting in slight increases in occupational doses.

NUREG-1437 concluded that over a renewal period, the greatest increment to higher doses was assumed to be a ten-year In Service Inspection outage. The dose increment related to aging was forecast to be an increase of 25%, or a BWR increase from 439 person/rem to 535 person/rem. The range of cancer deaths caused by industry wide collective exposure is 0-17. So the conclusion in the GEIS is that the exposure risk after license renewal is not expected to be significantly different from that during the initial license term, so occupational exposure was made it a category 1 issue.

In draft Supplement 16 for QC, the staff agreed with the GEIS and concluded that there were no impacts related to occupational exposure beyond the

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GEIS, the overall impact on occupational exposure is SMALL, and *additional plant-specific mitigation measures are not likely to be sufficiently beneficial to be warranted* (Supplement 16, Section 4.3). The conclusion was that the maximum doses during the renewal term is within the range of doses experienced during normal operation and maintenance outages, and would be well within regulatory limits.

In a review of the collective occupational doses at QC from 1999-2002, IEMA determined that the collective doses by year were: 169 person-rem/year in 1999, 847 person-rem/year in 2000, 126 person-rem/year in 2001, and 1,722 person-rem/year in 2002. Two of the four years are quite good; two are quite bad. It is difficult to forecast a trend. We assume plant radiation protection personnel follow rigorous ALARA procedures, and individual doses remain well within regulatory limits.

We understand that collective doses are related to the background radiation levels resulting from the source term from activated corrosion products in the reactor and related systems, and the number of outages at a plant each year. IEMA hopes that 800 and 1,700 person-rem/year level collective doses are not indicative of the doses to be expected during the renewal term. Part of our concern is that the QC plants are in the bottom quartile of nuclear plants in regard to source term. Therefore, we question the NRC conclusion that no mitigative measures are needed in the renewal term. Many of those accumulating these exposures are Illinois citizens.

Therefore, IEMA would like to see as a condition to PLEX application approval, a requirement for the licensee to proactively monitor and control the source term over the renewal period. Decontamination and preventive methods are available to keep source terms under control.

It can be argued that there were an extraordinary number of maintenance outages in those years when the levels were high. Granted, the cause of much of the high exposures in 2002 is due to outages related to steam dryer failures. One plant had back-to-back failures. The plant's UFSARs assume structurally sound steam dryers in their current licensing basis. The QC steam dryers have not remained structurally sound. In addition, the root cause analyses and corrective actions done as a result of the first failure did not prevent the second failure.

Extended power upgrades are speculated to be the root cause of the dryer failures. That may or may not turn out to be the case. Regardless, we assume those increased power levels will extend into the renewal period. We noted from inspection reports that during the scoping inspections done at QC, the steam dryers were not considered reactor internal components for PLEX purposes, although the

FSAR does list them as a reactor internal component. Additionally, they were excluded from age related degradation management programs prior to and during the renewal period. The reason given was because they were non-safety related, and failure is an operational concern, but not a safety concern. We are not so sure.

The conclusions of operability evaluations concerning the steam dryer failures made some assumptions. Among them was that any dryer parts that broke off would stay in the area of the separator/dryer, or be carried down the main steam line, where they would not affect any safety-related functions. It was determined as a result of the second dryer failure, some dryer material did not remain in the dryer area, but did travel through a recirculation loop and into the reactor vessel as a loose part. We anticipate that further engineering safety evaluations will conclude that the loose part(s) will cause no harm in the vessel. Regardless, thus far, steam dryer structural integrity is a present issue and contains large uncertainties over a twenty-year renewal term. Therefore, IEMA recommends that the status of the steam dryers at Quad Cities be re-evaluated as to their non-safety related status under PLEX, and be considered a reactor component subject to an aging management program.

In conclusion, our observations are that recent steam dryer problems at QC have caused forced outages. Only time will tell if the root cause of the dryer failures is a result of an extended power upgrade program. Regardless, the program will extend into the renewal term. It is not clear what effect the upgraded power level program might have on future plant component failures, but the increased number of outages needed to deal with them so far has dramatically increased the collective occupational exposure at the station. This was not anticipated in assumptions that went into the GEIS. Therefore, IEMA would like to see the steam dryers re-classified as a reactor component subject to an age-related degradation program under PLEX, and the licensee be required to commit to a proactive source term management program through the renewal term.

Again, IEMA appreciates the opportunity to submit these comments for consideration. We consider plant life extension to be a practical program in the nation's energy policy, and believe radiation and reactor safety can be maintained over a renewal term if adequate measures are taken to manage age related degradation. Please call me at (217) 785-9875 if these comments raise questions we can respond to.

Sincerely,

Neill Howey  
Senior Policy Analyst

**Bureau of Nuclear Facility Safety  
Illinois Emergency Management Agency**

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**To:** "quadcitiesEIS@nrc.gov" <quadcitiesEIS@nrc.gov>  
**Date:** 1/26/04 2:45PM  
**Subject:** QC Supplement 16 comments

Gentlemen,

Attached are Illinois Emergency Management Agency comments on NUREG-1437 Supplement 16 for the Quad Cities Plant Life Extension application. Thank you for the opportunity to comment.

<<QC PLEX Comments.doc>>

Neill Howey  
Senior Policy Analyst  
IEMA

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