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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

SUBJECT: Limerick Generating Station, Units 1 and 2
Revised Commitments With Regard to the
Crud Induced Localized Corrosion Related
Fuel Cladding Failures at Unit 1

Dear Sir:

This letter is to inform the NRC of revised commitments with regard to the crud induced localized corrosion (CILC) related fuel cladding failures which occurred during the second cycle of Limerick Generating Station (LGS), Unit 1 operation. By letter dated April 3, 1989, we provided the NRC with the results of our evaluation of the CILC related fuel cladding failures. That letter also provided the corrective actions and preventive measures to be implemented to address the causal factors of the failures. With respect to the water chemistry control program at both Unit 1 and Unit 2, we committed to install deep bed demineralizers to minimize copper input to the reactor water (one of the identified causal factors). Section 10.4.6 of NUREG-0991, "Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2," Supplement No. 8, dated June 1989, states that our commitment is to install the deep bed demineralizers: 1) no later than the next (third) refueling outage for LGS, Unit 1, currently scheduled to begin September 8, 1990, and 2) at the first refueling outage for LGS, Unit 2, currently scheduled to begin March 23, 1991.

Completion of both Unit 1 and Unit 2 deep bed demineralizer installations has been delayed due to the extended engineering effort required to incorporate vendor-specific demineralizer design features, and due to 1990 corporate budget reductions. The LGS Unit 1 deep bed demineralizer installation activities are progressing with plant outage-related work scheduled to be performed during the third refueling outage during the fall of 1990. The majority of the installation activities (i.e., non-outage related) will be performed subsequent to the third refueling outage with an expected service date for the LGS, Unit 1 deep bed demineralizers of March, 1992. The Unit 2 deep bed

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demineralizer installation activities are presently on hold with the exception of plant outage-related work which is scheduled to be performed during the first Unit 2 refueling outage in the spring of 1991. The eventual installation of the LGS, Unit 2 deep bed demineralizers is dependent on future corporate budget allocations. However, the earliest expected service date for the LGS, Unit 2 deep bed demineralizers could be October, 1992.

Additionally, in our April 3, 1989 letter, we committed to control the feedwater copper concentration during plant operation, and in particular, during power ascension, with a goal of less than or equal to 0.2 ppb on the basis that this goal would be re-evaluated with respect to plant operating experience. Actual plant operating experience with the existing filter demineralizers and optimal filter demineralizer performance indicates that a more realistic and achievable goal is less than or equal to 0.3 ppb. This new goal is supported by the results of a risk analysis performed to assess the impact of increased feedwater copper concentrations which shows that an incremental increase from 0.2 ppb to 0.3 ppb copper concentration in the reactor feedwater would produce a minimal increase in the risk of CILC, assuming chemical intrusions to the reactor water (i.e., a causal factor of CILC) are avoided or adequately counteracted. Therefore, as part of the water chemistry control program, a revised goal of less than or equal to 0.3 ppb feedwater copper concentration during plant operation has been established. Unit 1 typically operates with a feedwater copper concentration between 0.25 and 0.3 ppb, while Unit 2 typically operates with a feedwater copper concentration between 0.2 and 0.25 ppb. The goal of 0.3 ppb feedwater copper concentration will be maintained for each unit until the deep bed demineralizers are installed and placed in service.

Also, in our April 3, 1989 letter, as part of the chemistry action plan in response to the CILC related fuel cladding failures, we committed to perform on-line monitoring for total organic carbon (TOC) concentrations in the Unit 1 final feedwater in addition to the existing monitoring of TOC concentrations at other plant process locations. During restart of Unit 1 from the second refueling outage, the concentration of TOC in the final feedwater was monitored on-line. Values of 50 to 200 ppb of TOC were detected during long path flushing prior to Unit 1 startup. Long path flushing consists of recirculating the feedwater to the condenser hotwell rather than directing the feedwater to the reactor vessel. Following completion of the long path flushings, the final feedwater TOC concentrations returned to less than 10 ppb (i.e., the lowest level of detection capability of the TOC analyzer). Evaluation of the on-line TOC concentration data for the feedwater over the third cycle of Unit 1 operation indicates that less than detectable levels of TOC were maintained.

The results of the on-line TOC monitoring of the final feedwater indicate that this type of monitoring is unwarranted. Additionally, this type of monitoring is not included in Electric Power Research Institute (EPRI) or the Institute of Nuclear Power Operations (INPO) guidelines on Boiling Water Reactor (BWR) chemistry. Therefore, we intend to stop routine monitoring of final feedwater TOC concentrations as of the end of the third cycle of LGS, Unit 1 operation and focus our attention and resources on the control of recycled radwaste water input to the condensate storage tank (CST).

In our April 3, 1989 letter, we identified water chemistry transients which occurred early in the second cycle of LGS, Unit 1 operation as a causal factor for the CILC related fuel cladding failures. One such transient involved the intrusion of electro-hydraulic control (EHC) fluid into the reactor coolant system by way of transfer of recycled radwaste water to the CST. The EHC fluid entered the radwaste system as a result of EHC system leakage into floor drain sumps. As part of the effort to control recycled radwaste water input to the CST, station personnel have developed and implemented an aggressive program to monitor for EHC fluid at the radwaste sample tanks prior to transfer of the recycled radwaste water to the CST. This ensures that the quality of recycled radwaste water is acceptable for use in the reactor coolant system and helps to eliminate EHC fluid intrusions into the reactor coolant system.

If you have any questions, or require additional information, please contact us.

Very truly yours,

G. A. Hunger, Jr.

G. A. Hunger, Jr.
Manager
Licensing Section
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cc: T. T. Martin, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS