UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RE-USE OF FUEL CHANNELS WITH SHOREHAM FUEL

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated July 3, 1996 (Reference 1), PECO Energy Company requested NRC approval of re-use of low exposure Limerick initial core channels on Shoreham fuel bundles. In support of this request PECO submitted Reference 2, which provides an evaluation by General Electric Company (GE) of the impact of re-used fuel channels on channel-control blade interaction, thermal limits and the safety limit Minimum Critical Power Ratio (MCPR).

2.0 EVALUATION

A study was performed by GE (Reference 2) to determine the acceptability of reusing Limerick initial core channels on Shoreham fuel bundles in peripheral cell locations at Limerick Units 1 and 2.

The following key assumptions form the basis of this study:

- Channels that were located on the periphery during initial core use, will be located one row in during the initial re-use cycle.
- Channels that were used in Limerick Unit 2 initial core control cells will be used on the periphery for both re-use cycles.
- No more than two channels in their second re-use cycle will reside in an individual cell.
- The expected channel total exposure is less than typical single-bundle lifetime channel exposures which are taken to be approximately 35 GWd/ST. Therefore, the re-use of low exposure channels may be considered within single bundle lifetime criteria.

The GE Study reached the following conclusions:

- SIL 320 and SIL 320 Supplement 1 recommendations (as modified) are applicable to the use of Limerick initial core channels on Shoreham fuel bundles for two additional 24-month cycles of operation.
- The planned channel re-use is acceptable with respect to channel-control blade interaction.

- Channel bow associated with re-used channels will not impact the calculated SLMCPR.

- The use of low exposure initial core Limerick channels on ex-Shoreham fuel in low power regions of the core is not expected to result in any impact on thermal margins.

- Channel bow will impact the ex-Shoreham bundles' local peaking factors.

The staff has reviewed Reference 2 and agrees with the conclusions reached in the GE analyses. We also agree with PECO's assertion that since the Shoreham fuel bundles have received less than two effective full power days of exposure during startup testing that these bundles can be considered fresh fuel.

3.0 CONCLUSION

The re-use of fuel channels as proposed by PECO has been reviewed and approved previously by the staff at other sites such as Washington Nuclear Project Unit 2 and Oyster Creek. In addition, the licensee has provided an analysis showing that channel bow of the re-used channels will not impact calculated core safety limits. Therefore, provided the re-used channels are loaded within the assumptions made in Reference 2, PECO's proposal to re-use low exposure initial core fuel channels with Shoreham fuel is acceptable to the staff.

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4.0 REFERENCES

1. Letter from G. A. Hunger, PECO, to Document Control Desk, U.S. NRC, "Re-use of Fuel Channels on Ex-Shoreham Fuel Bundles," dated July 3, 1996.

2. G. N. Marrotte/R. P. Higgins, "Evaluation of Limerick Initial Core Channels for Re-use on ex-Shoreham Fuel Bundles," General Electric Company, dated April 1996 (Contains Proprietary Information).