PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTEPS 955-65 CHESTERBROOK BLVD. WAYNE, PA 19087-5691

(215) 640-6020

March 11, 1991

Docket No. 50-353

License No. NPF-85

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

SUBJECT: Limeri & Generating Station, Unit 2 Qualification Fuel Bundles in Operating Cycle 2

Dear Sirs:

Philadelphia Electric Company (PECo) plans to load twelve (12) commercially available qualification fuel bundles (QFbs) into Limerick Generating Station (LGS), Unit 2 during the first refueling outage scheduled to begin March 23, 1991. Accordingly, the purpose of this letter is to provide the NRC with information regarding our evaluation of these QFBs. These QFBs are comprised of four (4) General Electric (GE) Company GE11 QFBs, four (4) ABB Atom (ABBA), Inc. SVEA-96 QFBs, and four (4) Advanced Nuclear Fuels (ANF) Corp. 9x9-9X+ QFBs. The GE11 QFBs are a 9x9 design featuring part length fuel rods, the SVEA-96 QFBs are a 9x9 design featuring a water cross, and the ANF 9x9-9X+ QFBs are a 9x9 design featuring a large central water channel. Fuel bundles similar to each of these designs are currently operating in a domestic Boiling Water Reactor (BWR). The remainder of the reload bundles will be GE9B fuel.

Detailed descriptions of the GE11, SVEA-96, and ANF 9x9-9X+ QFBs are provided in Attachments 1, 4, and 5, respectively. Figures depicting the fuel rod lattice of the QFBs including U-235 enrichment and gadolinia distributions are also provided in these Attachments. Attachments 1 through 3 list the major foatures and design specifications of the GE11, SVEA-96 and ANF 9x9-9X+ QFBs, resectively.

GE has designed and analyzed the GE11 QFBs using NRC approved methods. The GE11 QFBs are designed for, and meet, the same nuclear-thermal-mechanical criteria as standard reload bundles. Furthermore, analyses will be performed for the GE11 QFBs specifically for operation during LGS Unit 2 Cycle 2 and subsequent cycles wherein the effect of the four GE QFBs will be considered for each of the applicable design basis events to establish appropriate core thermal limits. These analyses will be reviewed by the Plant Operations Review Committee ("ORC) and approved prior to Unit 2 startup from the first refueling outage.

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The SVEA-96 and ANF 9x9-9X+ QFBs have been designed to be mechanically, thermal-hydraulically, and neutronically compatible with the LGS Unit 2 Cycle 2 GE9B reload fuel bundle (i.e., GE9B-P8CWB325-9GZ210GZ-BOM-150-T). Analyses have been performed by ABBA and ANF to verify this compatibility and to conservatively evaluate the response of these QFBs to each of the appropriate design basis events relative to the GE9B reload bundle. The results of these analyses demonstrate that the SVEA-96 and ANF 9x9-9X+ QFBs are conservatively bounded by the GE98 reload fuel bundle analyses and can be safely operated in the reactor core and monitored by the plant process computer. These analyses will be reviewed by PORC and approved prior to Unit 2 startup from the first refueling outage. With regard to minimum ciritical power ratio (MCPR), the results of the analyses establish the effective operating limit MCPRs for the QFBs relative to the GE9B reload fuel bundle. These results will be utilized to conservatively set the operating limit MCPR for each QFB in the LGS Unit 2 Cycle 2 Core Operating Limits Report These limits, along with the fuel bundle uranium mass, will then be supplied in the plant process computer for monitoring QFBs during operation. No other SVEA-96 or ANF 9x9-9X+ QFB specific data or constants need to be input to the plant process computer databank. The results of these analyses are summarized in Attachments 4 and 5.

Attachment 6 to this letter identifies the anticipated reactor core loading positions for each of the QFBs. These positions, which are typically lower in power than more central reactor core positions, will further assure that the QFBs will not be limiting fuel bundles with respect to thermal limits. As part of our routine reactor core management activities, exposure-dependent control rod patterns have been developed to meet all reactor core operating limits and to verify that operating margins exist between the QFBs and the limiting fuel bundles. These margins will be maintained by reactor core monitoring activities.

Attachments 1 through 5 of this letter contain information which is proprietary to GE, ABBA, and ANF. Accordingly, we request that these attachments be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790(b)(1). Affidavits supporting this request are included in Attachments 1 through 5.

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

Very truly yours,

RM Klich for

G. J. Beck, Manager Licensing Nuclear Engineering and Support

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Attachment 1 - GE11 Lead fuel Assembly Description and accompanying affidavit

- Attachment 2 ABBA SVEA-96 Design Features and Specifications and accompanying affidavit
- Attachment 3 ANF 9x9-9X+ Design Features and Specifications and accompanying affidavit

Attachment 4 - ABBA Report BR-91-042 and accompanying affidavit

Attachment 5 - ANF Report ANF-90-193(P) and accompanying affidavit

Attachment 6 - QFB Core Loading Positions

cc: T. T. Martin, Administrator, Region I, USNRC w/ attachments T. J. Kenny, USMRC Senior Resident Inspector, LGS w/ attachments