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U. S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Mail Stop OP1-17  
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
REPLACEMENT OF MAIN TURBINE ROTORS  
UNITS 1 AND 2  
PLA-5565**

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**Docket Nos. 50-387  
and 50-388**

The purpose of this letter is to notify the NRC that PPL Susquehanna, LLC has updated the SSES Main Turbine Missile Probability Analysis.

Siemens Power Corporation (SPC) will design, manufacture and install new Siemens LP turbine rotors in the Susquehanna Units Nos. 1 & 2 in the Spring 2003 and 2004. Each Susquehanna unit consists of a High Pressure (HP) and three double flow Low Pressure (LP) turbines, which are tandem, compounded with a rated speed of 1800 RPM. Each LP turbine consists of a total of six shrunk-on disks (three per flow).

SPC has prepared an updated missile probability analysis, "Missile Probability Analysis Methodology For PPL Susquehanna, Units 1 & 2 With Siemens Retrofit Turbines, Revision No. 2", in support of this turbine modification work. This analysis accounts for the retrofitted turbine design in conjunction with an interface to the existing GE turbine overspeed controls, which are not being modified. The basic principles of the missile probability analysis methodology are the same as those used by SPC in previous studies and installations involving replacement of GE turbines with SPC turbines (e.g. Limerick, Grand Gulf, Comanche Peak, and Connecticut Yankee). This methodology has been reviewed and accepted by the NRC.

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For steam turbines at nuclear power plants, the NRC requires the equipment manufacturer to perform a probability study to confirm that the likelihood of producing an external missile, P1, remains below the value of 1 E-5 per year for a turbine with an unfavorable orientation with respect to the reactor containment. Susquehanna 1 & 2 both have this unfavorable orientation. Turbine inspection intervals and overspeed protection system test intervals are set to insure that the external missile probabilities remain below the NRC's required limits.

The SPC updated turbine missile probability analysis supports the existing main turbine inspection and valve testing program outlined in FSAR section 10.2.3.6, Inservice Inspection. This inspection program reflects that:

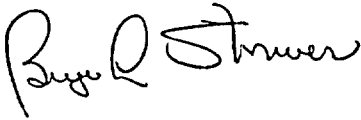
- A thorough volumetric ultrasonic examination is conducted on all rotors (both the high pressure and the three low pressure). In addition, all accessible rotor surfaces are inspected visually and by magnetic particle testing. These inspections are conducted at intervals of 10 years.
- A test interval for the main stop, control, and combined intermediate valves is established which is not greater than three months, i.e. Quarterly/Quarterly/Quarterly. This current test interval reflects GE TIL 969, Revision 1 and GET-8039.1, "Probability of Missile Generation in General Electric Nuclear Turbines – Supplementary report: Steam Valve Surveillance Test Interval Extension, September 1993". Inspection at this frequency limits the probability of excessive overspeed due to a main turbine valve fail-to-close event.

The SPC updated turbine missile probability analysis has been reviewed and approved by PPL. The analysis concludes that the probability of generating a missile, P1, is within the NRC accepted limit of 1 E-5 per unit per year for the PPL 10-year turbine inspection and Quarterly/Quarterly/Quarterly valve test frequency. The overall probability for unacceptable damage due to turbine missiles, P4, is less than 1 E-7. This meets the requirements of Regulatory Guide 1.115 and Standard Review Plan sections 3.5.1.3 and 2.2.3, as outlined in NUREG-0776, "Safety Evaluation Report Related to the Operation of Susquehanna Steam Electric Station Unit 1 & 2."

Attachment 1, "Comparison of External Missile Probabilities Inducing Overspeed with NRC Limit" is a copy of the curve of missile probability, P1, versus service time (inspection interval) for the PPL main turbine retrofit by SPC. This curve reflects the main turbine inspection and valve testing requirements outlined above.

Any questions regarding this additional information should be directed to  
Mr. Duane L. Filchner at (610) 774-7819.

Sincerely,

A handwritten signature in cursive script, appearing to read "B. L. Shriver".

B. L. Shriver

Attachments: Attachment 1 - Comparison of External Missile Probabilities including  
Overspeed with NRC Limit

copy: NRC Region I  
Mr. D. J. Allard, PA DEP  
Mr. T. G. Colburn, NRC Sr. Project Manager  
Mr. S. Hansell, NRC Sr. Resident Inspector  
Mr. R. Janati, DEP/BRP

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**Attachment 1 to PLA-5565**

**Comparison of External Missile Probabilities  
Including Overspeed with NRC Limit**

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FIGURE 1  
COMPARISON OF EXTERNAL MISSILE  
PROBABILITIES INCLUDING OVERSPEED WITH NRC LIMIT

