UNITED STATES
NUCLEAR REGULATORY COMMISSION
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MEMORANDUM FOR: Jack E. Rosenthal, Chief
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SUBJECT: SOUTH TEXAS NUCLEAR STATION STANDBY DIESEL GENERATORS INADVERTENT STARTS

On April 4 through April 7, 1994, Eric J. Lee, AEOD staff, visited the South Texas Nuclear Station to gather information on the cause of standby diesel generators (SDG) inadvertent starts. The documents reviewed at the site include a SDG engineering diagram and station problem reports on SDG inadvertent starts. The staff also examined a SDG control circuit and interviewed an engineer who is responsible for the SDG.

The staff's findings are as follows:

1. The causes of the inadvertent SDG starts identified during the review include component failures (surge suppressor varistors and start transistors) and corrosioning of the connector for the start transistor.

2. The SDG control circuit environmental conditions are harsh:

   A. The normal operating environmental temperature is well over 100 °F.
   B. The air contains high levels of humidity and salt.

   Note: Turkey Point plant has a similar SDG control configuration and environmental conditions; however, it controls its environment using air conditioning. Cooper plant also has a similar configuration; however, Cooper is located in cooler climate.

3. The SDG inadvertently started more than three times since October 19, 1993. (For six years, the SDG only had minor failures.)

4. Tests show that existing start transistors from the SDG control circuit fail to operate when the environmental temperature reaches a little over 100 °F; however, the newly bought transistor did not fail even when the environmental temperature reached over 120 °F.

The findings indicate that harsh South Texas environmental conditions caused the semiconductor components (transistors and varistors) to age rapidly and thereby lead to the component failures which caused the inadvertent SDG starts. The licensee agrees with this conclusion, and currently is in the process of evaluating corrective actions, including controlling the environment by adding an air conditioner or replacing the semiconductor components with relays.

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