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

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPT 12
Response to NRC Bulletin 89-03

Gentlemen:

Attached is the South Carolina Electric & Gas Company response to the requested actions identified in the NRC Bulletin 89-03, "Potential Loss Of Required Shutdown Margin During Refueling Operations," and provided pursuant to 10CFR50.54(f).

I declare that the statements and matters set forth herein are true and correct to the best of my knowledge, information and belief.

Should you have any questions, please call at your convenience.

Very truly yours,

O. S. Bradham

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SOUTH CAROLINA ELECTRIC & GAS COMPANY
RESPONSE TO NRC BULLETIN 89-03

Requested Actions:

Operating Reactors:

All PWR licensees are requested to assure that adequate shutdown margin is maintained during all refueling operations. This should be accomplished through the following actions.

ACTION (1)

Assure that any intermediate fuel assembly configuration (including control rods) intended to be used during refueling is identified and evaluated to maintain sufficient refueling boron concentration to result in a minimum shutdown margin of approximately 5%.

RESPONSE: The first two fuel assemblies loaded into the core, both containing secondary neutron sources, are placed on opposite sides of the core close to the source range detectors and are in an intermediate core position.

After seven to ten fuel assemblies per source range detector are loaded, the fuel assemblies containing the neutron sources are repositioned to their final position.

These secondary source fuel assemblies are placed in their initial position to provide the best nuclear coupling of fuel and detector at the start of a core reload. They are moved early in the reload to prevent masking the inverse count rate ratio calculation (ICRR).

The minimum calculated boron concentration is 1900 ppm. Technical Specifications requires a minimum boron concentration of 2000 ppm. The reactor coolant system and refueling cavity are filled from mid-loop from the refueling water storage tank having a minimum boron concentration of 2300 ppm. Therefore, it can be concluded that VCSNS maintains sufficient refueling boron concentration to result in a minimum shutdown margin of 5%. It can be concluded that VCSNS maintains sufficient refueling boron concentration to result in a minimum shutdown margin of 5%.

ACTION (2)

Assure that fuel loading procedures only allow those intermediate fuel assembly configurations that do not violate the allowable shutdown margin and that these procedures are strictly adhered to.

RESPONSE: In response to IEN 89-51, Virgil C. Summer Nuclear Station added to the core loading procedure the following guidelines concerning intermediate fuel assembly configurations.

- a. All boxing configurations will be made up with assemblies in their final configuration.
- b. All assemblies will be stored along the core barrel and not along an adjacent fuel assembly.

Already present in the core loading procedure is that an intermediate fuel assembly configuration shall not result in the creation of a two by two array of adjacent fresh fuel assemblies.

This procedure is strictly adhered to and during refueling operations copies of it are present in the Control Room, Fuel Handling Building and the Reactor Building.

ACTION (3)

Assure that the staff responsible for refueling operations is trained in the procedures recommended in Item 2 above and understand the potential consequences of violating these procedures. This training should include the fundamental aspects of criticality control with higher enriched fuel assemblies.

RESPONSE: This bulletin and the core shuffle procedure will be discussed among core engineering personnel in a documented training session.

This Bulletin has been put into required reading for Core Engineers and Operations personnel.

This Bulletin has been incorporated into a lesson to be taught to licensed Operations personnel before the next refueling outage begins.