Stephen A. Byrne
Vice President, Nuclear Operations
803.345.4622

SCE&G®
A SCANA COMPANY

May 15, 2001
RC-01-0103

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

Attention: Ms K. R. Cotton

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
14-DAY REPORT REGARDING EXCEEDING LICENSE CONDITION 2.C(1) - MAXIMUM POWER LEVEL

Per Operating License Condition 2.G(1), please find attached the 14-day report regarding the brief power excursion which violated Condition 2.C(1) - Maximum Power Level. This event occurred on May 1, 2001, at 1527 hours and lasted for less than four minutes.

Very truly yours,

Gregory Halnon for SAB

Stephen A. Byrne

PAR/SAB/dr
Attachment

c: N. O. Lorick
N. S. Carns
T. G. Eppink (without attachment)
R. J. White
L. A. Reyes
K. R. Cotton
K. W. Sutton

NRC Resident Inspector
D. M. Deardorff
INPO Records Center
NSRC
RTS (O-C-01-0616)
File (810.32)
DMS (RC-01-0103)

A 001

At 1527 hours on May 1, 2001, while operating at 100% power, a plant transient caused by a feedwater heater level transmitter failure resulted in core power exceeding the licensed limit of 2900 megawatts thermal (MWt). The Thermal Q Exceeds annunciator in the control room alarmed, which initiated an engineering evaluation on whether the licensed power limit was actually exceeded. No automatic load reduction or other safety actuation occurred.

Control Room operators were aware of the feedwater transient and were involved in monitoring and mitigation of the event. Based on main control board delta-T indication (0 to 150% scale), initial operator determination was that the transient was limited to less than 102% rated thermal power. Only after computer printouts were obtained and evaluated was the determination that the licensed limit was exceeded.

The failure of the number 2A feedwater level transmitter (ILT3783B) caused the 1A and 2A high pressure heaters to isolate. This reduced heating of the feedwater, causing the feedwater temperature to decrease. The drop in feedwater temperature resulted in a subsequent drop in reactor coolant temperature. The introduction of colder water into the reactor caused a positive reactivity addition, which caused a brief increase in reactor power.

A third condensate pump was started, the failed transmitter was removed from service, and the high pressure heaters were reset to stabilize the plant. Preparations were made to commence power reduction, including borating 20 gallons, but by this time conditions were stabilized with the feedwater heaters reset; power returned to less than 2900 MWt and no power reduction was performed. The duration was determined to be less than four minutes.

The actual maximum power level reached during this transient was evaluated. There is a variety of data available that provides an indication of reactor thermal power. Data such as nuclear instrumentation, first stage turbine pressure, and gross electrical power either showed no significant increase or actually decreased during this transient. Various calorimetric calculations performed by the station's computerized calorimetric program, Fivcals, indicated both increases and a decrease in thermal power. Reactor coolant delta-T indicated a rise in thermal power.

The primary method by which compliance with the licensed thermal power is determined, during steady state operation, is by observing the value of the calorimetric calculation referred to as Qcore 1. This calculation is based on feedwater mass flow rate and the enthalpy rise across the steam generators. Exceeding thermal power limits, as determined by Qcore 1, was the cause of the control room annunciator alarm.

Due to the upset conditions in the secondary plant, Qcore 1 is considered to be a less reliable methodology for determining thermal power. With a rapid drop in feedwater temperature and uncertainty in steam enthalpy, the enthalpy rise across the steam generators may not be accurate.

Since secondary plant parameters that are used as inputs to Qcore 1 were changing, the most reliable method of determining changes in reactor power would be based on reactor coolant delta-T. Qcore 3, which is based on RCS mass flow rate and enthalpy drop across the steam generators, rose approximately 1.7%. Individual loop delta-T values rose by approximately 2.1% for loop A to 2.5% for loop C.

With delta-T based calculations being regarded as the most meaningful indicators of reactor thermal power under these transient conditions, the most conservative determination of peak power reached is 102.5% rated thermal power.

A review of lessons learned has been completed with each operating shift. Additional corrective action will include: Operations procedures are being reviewed to assess the adequacy of procedures to mitigate the effects of a feedwater heater transient (to be completed by July 30, 2001), and additional training on plant response to heater trips to be provided to Operations by November 23, 2001.