

October 23, 2000

Mr. Steve Byrne
Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88
Jenkinsville, South Carolina 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - CRACK IN WELD AREA OF
REACTOR COOLANT SYSTEM (TAC NO. MB025)

Dear Mr. Byrne:

In an event report submitted on October 12, 2000, under the requirements of 10 CFR 50.72, you indicated that the Virgil C. Summer Nuclear Station, Unit No. 1 (Summer), shut down the reactor on October 7, 2000, for a scheduled refueling outage. During a containment inspection, plant personnel identified a large quantity of boron on the floor and protruding from the air boot around the "A" loop reactor coolant system hot leg pipe. On October 12, 2000, when investigating the source of the leakage, a dye penetrant test revealed a 4-inch-long circumferential hairline crack in the weld between the reactor vessel nozzle and the "A" hot leg pipe.

We conducted a teleconference with your company on October 13, 2000, to discuss your assessment of the crack and your plans for root cause analysis and repair. During that call we discussed the kinds of information we expect to receive as your assessment progresses. We informed you that we would deliver a written list of the information requests to you that afternoon. The requests for information delineated below were given to you on October 13, 2000, to help guide you in your initial assessment planning. The purpose of this letter is to publicly document the request for information, which was delivered to you informally by the NRC inspection staff on October 13, 2000.

1. Based on the estimated flaw size, what would be the predicted magnitude of the leakage?
2. Describe the leak detection procedures and containment leakage detection capability at Summer, and discuss why the leak was not discovered during plant operation.
3. When was the subject weld last inspected and what were the results of that inspection? Also, discuss the inspections of the reactor pressure vessel welds. Describe the inspection technique(s) utilized, and the qualifications of those techniques and personnel, if any. Provide your estimate of the probability of detection for a 4-inch crack that is 25-percent, 50-percent, and 100-percent through-wall.

S. Byrne

- 2 -

4. Based on your review of the construction radiograph (RT) films for the subject (and other, as appropriate) welds, describe the results. In retrospect, based on this re-review of the RT films, could construction-related defects have been overlooked? Have the RT films been digitized and enhanced? Please explain.
5. What is the design cumulative usage factor for the subject weld?
6. Describe, in detail, the inspection plans for the subject (and other, as appropriate) welds. Include in this description, as a minimum, what is to be inspected, scope expansion, and the inspection techniques to be used, including how the techniques and examiners are to be qualified, the establishment of inspection uncertainties from tooling positioning, and of measurement errors associated with the transducers.
7. By letter dated June 22, 1992, SCE&G requested to eliminate from the Summer design basis the dynamic effects of postulated pipe ruptures in the reactor coolant piping, based on a leak-before-break analysis. The staff granted this request later that year. Based on the cracking found to date, describe the implications of the missed leak on the bases of this request and approval, and what, if any, revisions to the present design basis should be made.
8. Describe your schedule and scope for performing a root cause determination. As this is a unique situation, discuss your plans for the removal of the crack, or portions thereof, for destructive metallurgical examination, and the metallurgical and fractographic analyses you are planning to perform to determine the failure mode. Provide a comparison of the ultrasonic examination performed on the in-situ weld and the destructive metallurgical examination to be performed.
9. Describe in detail the schedule and scope for performing repairs for the subject weld.

As you know, NRC has chartered a Special Inspection Team to review the event. If you have any questions with regard to this request, please feel free to contact me. I can be reached at 301-415-1465.

Sincerely,

/RA/

Karen R. Cotton, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-395

cc: See next page

4. Based on your review of the construction radiograph (RT) films for the subject (and other, as appropriate) welds, describe the results. In retrospect, based on this re-review of the RT films, could construction-related defects have been overlooked? Have the RT films been digitized and enhanced? Please explain.
5. What is the design cumulative usage factor for the subject weld?
6. Describe, in detail, the inspection plans for the subject (and other, as appropriate) welds. Include in this description, as a minimum, what is to be inspected, scope expansion, and the inspection techniques to be used, including how the techniques and examiners are to be qualified, the establishment of inspection uncertainties from tooling positioning, and of measurement errors associated with the transducers.
7. By letter dated June 22, 1992, SCE&G requested to eliminate from the Summer design basis the dynamic effects of postulated pipe ruptures in the reactor coolant piping, based on a leak-before-break analysis. The staff granted this request later that year. Based on the cracking found to date, describe the implications of the missed leak on the bases of this request and approval, and what, if any, revisions to the present design basis should be made.
8. Describe your schedule and scope for performing a root cause determination. As this is a unique situation, discuss your plans for the removal of the crack, or portions thereof, for destructive metallurgical examination, and the metallurgical and fractographic analyses you are planning to perform to determine the failure mode. Provide a comparison of the ultrasonic examination performed on the in-situ weld and the destructive metallurgical examination to be performed.
9. Describe in detail the schedule and scope for performing repairs for the subject weld.

As you know, NRC has chartered a Special Inspection Team to review the event. If you have any questions with regard to this request, please feel free to contact me. I can be reached at 301-415-1465.

Sincerely,

/RA/

Karen R. Cotton, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-395

cc: See next page

Distribution:

PUBLIC

PD II-1 Rdg.

RidsNrrDlpmLpdii1 (paper copy)

RidsNrrLAEDunnington (paper copy)

RidsAcrsAcnwMailCenter

RidsRgn2MailCenter

RidsNrrPMKCotton (paper copy)

CECarpenter

RidsOgcRp

OFFICE	PDII-1/PM	PDII-2/LA	PDII-1/SC
NAME	KCotton:cn	EDunnington	REmch
DATE	10/20/00	10/20/00	10/23/00

Accession Number ML003762257 OFFICIAL RECORD COPY

Mr. Stephen A. Byrne
South Carolina Electric & Gas Company

VIRGIL C. SUMMER NUCLEAR STATION

cc:

Mr. R. J. White
Nuclear Coordinator
S.C. Public Service Authority
c/o Virgil C. Summer Nuclear Station
Post Office Box 88, Mail Code 802
Jenkinsville, South Carolina 29065

J. B. Knotts, Jr., Esquire
Winston & Strawn Law Firm
1400 L Street, N.W.
Washington, D.C. 20005-3502

Resident Inspector/Summer NPS
c/o U.S. Nuclear Regulatory Commission
Route 1, Box 64
Jenkinsville, South Carolina 29065

Chairman, Fairfield County Council
Drawer 60
Winnsboro, South Carolina 29180

Mr. Henry Porter, Assistant Director
Division of Waste Management
Bureau of Land & Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Bruce C. Williams, General Manager
Nuclear Plant Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Mail Code 303
Post Office Box 88
Jenkinsville, South Carolina 29065

Mr. Melvin N. Browne, Manager
Nuclear Licensing & Operating Experience
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Mail Code 830
Post Office Box 88
Jenkinsville, South Carolina 29065