



May 21, 2015

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

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS), UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12  
SPECIAL REPORT (SPR) 2014-006  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

- Reference:
1. Letter from T. D. Gatlin (VCSNS) to Document Control Desk (NRC), "SPECIAL REPORT (SPR 2014-006)," dated November 5, 2014 [ML14314A033]
  2. Letter from S. A. Williams (NRC) to T. D. Gatlin (VCSNS), "Virgil C. Summer Nuclear Station, Unit No. 1 – Request for Additional Information (TAC No. MF5164)", date March 26, 2015 [ML15079A099]

South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority pursuant to the requirements of Technical Specifications 6.9.1.12, submitted the Steam Generator Tube Inspection Report (Reference 1) following the 2014 Spring Refueling (RF-21) Outage. NRC's review of Reference 1 determined that additional information is required and a Request for Additional Information (RAI) was issued per Reference 2. The Attachment of this letter contains SCE&G's response to the RAIs in Reference 2.

Should you have any questions, please call Mr. Bruce Thompson at (803) 931-5042.

Very truly yours,

Thomas D. Gatlin

WLT/TDG/wm  
Attachment

c:	K. B. Marsh	W. M. Cherry	INPO Records Center
	S. A. Byrne	V. M. McCree	NSRC
	J. B. Archie	S. A. Williams	RTS (CR-15-01442)
	N. S. Carns	NRC Resident Inspector	File (818.08)
	J. H. Hamilton	K. M. Sutton	PRSF (RC-15-0081)
	J. W. Williams		

ADDI  
NRR

Document Control Desk  
Attachment  
CR-15-01442  
RC-15-0081  
Page 1 of 5

---

---

**VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12**

**ATTACHMENT I**

**Request for Additional Information (RAI) Response**

---

---

## VC Summer Spring 2014 Steam Generator Inspection Report RAIs

By letter dated March 26, 2015 [ML15079A099], NRC requested the following information to continue review of the Spring 2014 steam generator tube inspections performed at Virgil C. Summer Nuclear Station, Unit 1.

### **RAI No. 1:**

***Please provide the cumulative number of effective full power months (EFPMs) that the steam generators had operated for the last 4 refueling outages. Please also provide the number of EFPMs that the steam generators (SGs) had operated at the time of the first inservice inspection.***

VC Summer Response:

The approximate cumulative effective full power months (EFPM) that the VC Summer Steam Generators have operated are identified below.

1st ISI - RF-09 (Spring 1996) – 15.3 EFPM  
RF-17 (Spring 2008) – 141.9 EFPM  
RF-18 (Fall 2009) – 157.6 EFPM  
RF-19 (Spring 2011) – 173.3 EFPM  
RF-20 (Fall 2012) – 189.7 EFPM  
RF-21 (Spring 2014) – 205.2 EFPM

### **RAI No. 2:**

***Please discuss the results of the channel head bowl inspections, upper bundle video inspection in SG A, steam drum inspections, and tube plug inspections. For the tube plug inspections, were all plugs present and in their proper locations? Was any degradation observed?***

VC Summer Response:

#### Channel Head Bowl Inspections

Westinghouse Nuclear Safety Advisory Letter NSAL-12-1 recommends visual inspection of the channel head near the bowl drain line to determine if degradation of the cladding and potential degradation of the channel head base material have occurred. All three SG channel heads were visually inspected during RF-21. The observed conditions were consistent with the manufacturing process and did not exhibit any signs of degradation. Visual inspection concluded that a condition similar to that documented in NSAL-12-1 does not currently exist at VC Summer.

### Tube Plug Inspections

Five tubes were plugged in the VC Summer Steam Generators during RF-12 (Fall 2000). This was the last outage when tubes were plugged at VC Summer. Three tubes were plugged prior to installation at the factory. The cumulative total number of tube plugs is eight.

All installed plugs were inspected for degradation and evidence of leakage. All plugs were determined to be in their proper location. No degradation was noted. No dripping plugs were identified and all plugs were found to be dry.

### Upper Bundle Video Inspection in SG A

A tube lane and in-bundle inspection was performed on the top tube support plate of SG A. The inspection was performed in the tube lane as well as in approximately every tenth column of the tube bundle on both the hot leg and cold leg sides.

The inspection of the tube lane region of the top tube support plate resulted in no tube wear, anomalies, or foreign objects being observed. Very little loose sludge was found in the tube lane while no hard sludge was observed. The support plate's circular flow holes in the tube lane region were clear of sludge and other deposits while the center stayrod nuts observed were intact and appeared to be in good condition. Finally, the visible anti-vibration bars were all intact and properly aligned.

During the in-bundle inspections, no tube wear, tube anomalies, or foreign objects were observed. In addition, no support plate anomalies, such as ligament cracking or loss of material, were observed. The tube column gaps were relatively clean but some loose sludge was observed in-bundle on the top surface of the support plate. The support plate did possess some partial blockage of some of its quatrefoils due to the loose sludge.

### Steam Drum Inspections

Visual inspections of the steam drum region were performed in all three steam generators. The visual inspections included examinations of all visibly accessible components within the steam drum region of each steam generator. The goal of the steam drum visual inspections was to provide an overall inspection of each steam generator's steam drum components and to identify any evidence of degradation, damage, deformation, anomalies, abnormalities, loose parts, potential loose parts, and foreign objects. The following components were inspected:

- Primary Moisture Separators
- Secondary Moisture Separators
- Steam Outlet Nozzle
- Internal Deck Plates
- Feedwater Ring and Nozzles
- Auxiliary Feed Pipe and Nozzle
- Sludge Collector Assembly
- Shell Inner Diameter Surface

The inspections revealed no visible signs of degradation or structural issues that would prohibit continued steam generator operation and threaten tube integrity until the next scheduled steam drum inspections.

**RAI No. 3:**

***In Table 2, there is an inspection category for “cold leg new bobbin wear.” Were all of the new wear indications located on the cold leg? If not, were new wear indications in the hot leg inspected?***

VC Summer Response:

The category identified in Table 2 of the RF-21 VC Summer Steam Generator Tube Inspection Report as “cold leg new bobbin wear” was a special interest inspection that is a bobbin retest using an AVB wear standard. The same special interest inspection was performed on the hot leg as well. Hot Leg Inspection Scope is in Table 1.

Table 1 – Hot Leg Bobbin Retest with AVB Standard		
SG A	SG B	SG C
2	6	4

**RAI No. 4:**

***Please discuss which tubes would not pass a bobbin probe. Were these all low row (i.e., rows 1 and 2) tubes? If not, please discuss the nature of the restrictions in these tubes.***

VC Summer Response:

Inspection scope discussed in Section 2 of RF-21 VC Summer Steam Generator Tube Inspection Report Inspection report described:

- 1) U-bend +Point inspection of tubes that a bobbin probe would not pass through

This statement referred to a planned inspection scope of low row u-tubes. There were no restricted/blocked tubes that a bobbin probe would not pass through. As such, as-tested inspection scope did not change from the planned inspection scope. Sample size for this inspection scope is identified in Table 2.

Table 2 – U-Bend +Point Inspection of Low Row U-Tubes		
SG A	SG B	SG C
23	44	40