**Ronald B. Clary**
*Vice President*
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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

ATTN: Document Control Desk

Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028
Response to NRC Request for Additional Information (RAI) Letter No.080 Related to Equipment and Floor Drainage System

Reference: Letter from Tanya Simms (NRC) to Alfred M. Paglia (SCE&G), Request for Additional Information Letter No. 080 Related to SRP Section 09.03.03 for the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application, dated March 31, 2010 related to Equipment and Floor Drainage Systems.

The enclosure to this letter provides the South Carolina Electric & Gas Company (SCE&G) response to the RAI items included in the above referenced letter. The enclosure also identifies any associated changes that will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA.

Should you have any questions, please contact Mr. Alfred M. Paglia by telephone at (803) 345-4191, or by email at apaglia@scana.com.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 27th day of April, 2010.

Sincerely,

Ronald B. Clary
Vice President
New Nuclear Deployment

TWS/RBC/jf

Enclosure

D083
NRO

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**NRC RAI Letter No. 080 Dated March 31, 2010**

**SRP Section: 09.03.03 – Equipment and Floor Drainage System**

**QUESTION for Balance of Plant Branch 1 (SBPA)**

**NRC RAI Number: 09.03.03-1**

In AP1000 DCD, Revision 15, the waste water retention basin design features were included as part of the AP1000 certified design. In Revision 16, Westinghouse removed the waste water retention basin from the DCD and identified it as COL Information Item 9.2.11.2, "Waste Water Retention Basins." COL Information Item 9.2.11.2 states that "the Combined License applicant will address the final design and configuration of the plant waste water retention basins and associated discharge piping, including piping design pressure, basin transfer pump size, basin size, and location of the retention basins."

In VC Summer FSAR Section 9.2.9.2.2, "Component Description," a description of the wastewater retention basin was added to address AP1000 DCD COL Information Item 9.2.11.2. The information provided discusses the location and routing of the wastewater system, but does not address all of the details requested in the COL information item.

In order to meet GDC 60, applicant should demonstrate suitable control of the release of radioactive materials in liquid effluent. Provide a discussion on whether all site-specific potentially radioactive effluents draining into and downstream of the water basin will be monitored prior to disposition. Provide justification for not providing water level instrumentation and radiation monitoring in the wastewater retention basin.

Also, provide additional details on the method proposed for transfer of inventory from wastewater settling basin to the discharge canal and provide a description of the associated components (ie. transfer pumps, size of basin, basin lining, etc...) as requested in the COL information item. Verify that all site-specific potentially radioactive effluents will be monitored prior to disposition. Or provide a justification for why this information is not necessary.

**VCSNS RESPONSE:**

Each Unit 2 and 3 wastewater retention basin (WWRB) receives influent from the turbine building sump pumps and the associated oil separator. As discussed in DCD Subsections 9.2.9.2.1 and 11.5.2.3.3, a radiation monitor located on the common discharge piping of the turbine building sump pumps provides an alarm upon detection of radioactivity in the waste water. The radiation monitor stops the turbine building sump pumps and initiates an alarm in the main control room if the concentration of radioactive materials exceeds a predetermined setpoint. Following an alarm, the

operator can manually realign the discharge to the liquid radwaste system for processing. Provisions are included for sampling the turbine building sumps.

There are several WWRB influent pathways within the scope of the certified design that discharge downstream of the turbine building sump discharge radiation monitors. These sources of influent to the WWRB were discussed in the response to Westinghouse AP1000 RAI-SRP9.3.3-SBPA-02, and are summarized below:

1. Diesel Fuel Area Sumps

   The diesel fuel area sumps discharge to the Waste Water System (WWS) oil separator. This standard plant effluent does not interact with any potentially radioactive sources during operation, nor are there any recognized radioactive sources located in the vicinity of this portion of the WWS.

2. Service Water System (SWS) Cooling Tower Blowdown

   The SWS blowdown can be routed to the WWRB as depicted in DCD Figure 9.2.1-1. The SWS blowdown is equipped with a radiation monitor as discussed in DCD Subsections 9.2.1.5 and 11.5.2.3.1. The service water blowdown radiation monitor initiates an alarm in the main control room if the concentration of radioactive materials exceeds a predetermined setpoint. Following the alarm, the operator can manually isolate the blowdown flow. Provision is made for taking local fluid samples.

3. SWS Strainer Backwash

   The SWS strainer backwash is routed to the WWRB. The SWS radiation monitor described in DCD Subsections 9.2.1.5 and 11.5.2.3.1 will initiate an alarm in the control room if radiation is detected. Automatic strainer backwash operation should be temporarily disabled in the event of an alarm.

4. Circulating Water System (CWS) Strainer Backwash

   The CWS piping to the Turbine Building Closed Cooling Water System (TCS) is provided with a strainer to prevent fouling of the TCS heat exchangers. Backwash from this strainer is routed to the WWRB. Radiation monitoring of the CWS is not required since all systems interfacing with CWS that have plausible potential for contamination are provided with radiation monitoring. The CWS is operated at a higher pressure than the condenser; therefore radioactive contamination from the condenser is precluded.

For Units 2 and 3, there are no additional site specific systems that deliver influent streams to the WWRBs outside of those associated with the certified design described above. All WWRB influent streams with a potential to become radioactively

contaminated are monitored as discussed above, therefore no additional radiation monitoring is provided.

Effluent from each WWRB is discharged to the common site specific WWS blowdown sump via the basins' transfer pumps and associated piping. WWRB water level is monitored by a level control instrumentation system.

At the blowdown sump, located downstream of the WWRBs, the waste water stream mixes with the high volume CWS blowdown stream. As discussed in the Westinghouse response to AP1000 RAI-SRP9.3.3-SBPA-02, all systems interfacing with the CWS that have plausible potential for radioactive contamination are provided with radiation monitoring. Additionally, as described in FSAR Subsection 10.4.5.2.3, since the circulating water system operates at a greater pressure than the condenser, passage of condensate from the main condenser into the circulating water system through a condenser tube leak is not possible during power generation operation.

There is also a site specific local chemical addition package used to inject chemicals from local tanks into the CWS cooling tower basin, however this chemical addition feed does not interact with any potentially radioactive areas or sources. Therefore no additional radiation monitoring is provided.

The blowdown sump discharges to the Parr Reservoir via gravity through the plant outfall piping; a discharge canal is not used. A branch line from the liquid radwaste system (WLS) discharges to plant outfall piping downstream of the blowdown sump at a dilution point.

As discussed in DCD Subsection 11.5.2.3.3, the WLS discharge radiation monitor measures the concentration of radioactive materials in liquids released to the environment. The liquid releases are prepared in batches that are mixed thoroughly and sampled. The samples are analyzed on site before discharge to determine that the discharge is within allowable concentration limits and within allowable totals. As discussed in DCD Subsection 11.2.1.2.4, the discharge line contains a radiation monitor with diverse methods of stopping the discharge. The first method closes an isolation valve in the discharge line, which prevents any further discharge from the liquid radwaste system. The valve automatically closes and an alarm is actuated if the activity in the discharge stream reaches the monitor setpoint. The second method stops the monitor tank pumps. No additional radiation monitoring of this discharge stream is provided.

As described in VCSNS FSAR Subsection 9.2.11, the Raw Water System (RWS) provides water for dilution of liquid radwaste when CWS blowdown is not sufficient or available for that purpose. As discussed in VCSNS FSAR Subsection 9.2.11.4, the RWS does not have the potential to be a flow path for radioactive fluids. Therefore, no radiation monitoring for RWS is provided.

As described in VCSNS FSAR Subsection 9.2.6.2.1 the blowdown sump also receives sanitary waste effluent from the Sanitary Drainage System (SDS). As stated in DCD Subsection 9.2.6.3, there are no interconnections between this system and systems having the potential for containing radioactive material. Therefore, no radiation monitoring for SDS effluent stream is provided.

Therefore, no additional monitoring of the influent streams to the WWRB, the blowdown sump and the outfall piping has been provided.

Each WWRB described above is constructed using formed concrete and is a lined basin constructed such that its contents, dissolved or suspended, do not penetrate the liner and leach into the ground. The WWRB is designed to allow entrained solids to settle and allow for chemical treatment to effluent concentrations required for release prior to discharge to the blowdown sump. The configuration and sizing of the WWRB is to allow settling of solids larger than 10 microns that may be suspended in the waste water stream. Waste water can be sampled prior to discharge from the WWRB.

Each WWRB is divided into two separate compartments, which allows one compartment to be out of service while the other compartment is available. Each compartment discharges to a pump sump. A level transmitter located in each WWRB pump sump provides an alarm signal in the Main Control Room when the sump level(s) reach predetermined set points. The WWRBs for each unit are located in the yard area outside of each unit's Turbine Building.

The WWRB transfer pumps, described in VCSNS FSAR Subsection 9.2.9.2.2, are located in pump sumps adjacent to each compartment. The pumps are manually started and interlocked to stop based on sump level. There are two (one per sump) 100% capacity transfer pumps for each WWRB. The transfer pumps are sized to meet the maximum expected influent flow. The normal pump discharge flowpath is to the blowdown sump. Flow can also be directed to the alternate Unit's WWRB. In the event of oily waste leakage into the retention basin, a recirculation line is provided to recycle the oil/water waste from the basin to the oil separator.

The blowdown sump described above is a concrete structure and is open to the atmosphere. It is a common sump and accepts waste water from Unit 2 and 3's WWRBs, CWS cooling tower blowdown from both Units and sanitary waste effluent. As stated above, in the absence of CWS cooling tower blowdown, RWS supplies an alternate source of dilution water. The outfall pipe is sized with adequate capacity to gravity drain the blowdown sump at the highest anticipated influent flow rate. Therefore no level instrumentation is provided at the blowdown sump. Wastewater and blowdown effluent from the blowdown sump drains by gravity to Parr Reservoir via the plant outfall piping. Location of the plant outfall routing is shown on VCSNS FSAR Figure 1.1-202.

In a future revision to the VCSNS COLA, FSAR Subsection 9.2.9.2.2 will be revised to provide additional design details for the waste water retention basins to address COL Information Item 9.2.11.2.

This response is PLANT SPECIFIC.

**ASSOCIATED VCSNS COLA REVISIONS:**

In a future revision to the VCSNS COLA, FSAR Subsection 9.2.9.2.2, with a left margin annotation of VCS COL 9.2-2, will be revised to provide additional design details for the waste water retention basins to address COL Information Item 9.2.11.2. Text additions are shown in green-underlined text while deletions are shown in red-strikethrough text.

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9.2.9.2.2 Component Description

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Add the following text under the Waste Water Retention Basin paragraph of DCD Subsection 9.2.9.2.2 and add Basin Transfer Pumps as follows:

The waste water retention basin is constructed using formed concrete and is a lined basin ~~with two compartments~~ constructed such that its contents, dissolved or suspended, do not penetrate the liner and leach into the ground. ~~Either of these compartments can receive waste streams for holdup or, if required, for treatment to meet specific environmental discharge requirements.~~ Each Unit's Waste Water Retention Basin (WWRB) is located in the yard area outside of each Unit's respective Turbine Building. The WWRB is designed to allow entrained solids to settle and allow for chemical treatment of effluent concentrations required for release prior to discharge to the blowdown sump.

The configuration and size of the waste water retention basin allows settling of solids larger than 10 microns that may be suspended in the waste water stream. Waste water can be sampled prior to discharge from the waste water retention basin.

Each WWRB is divided into two separate compartments, which allows one compartment to be out of service while the other compartment is available. Each compartment discharges to a pump sump. A level transmitter located in each WWRB pump sump provides an alarm signal in the Main Control Room when the sump level(s) reach predetermined set points.

**Basin Transfer Pumps**

~~Two submersible type pumps, one per basin compartment, send the waste water from the retention basin to the blowdown sump for discharge at the plant outfall.~~ In the event of oily waste leakage into the retention basin, a recirculation line is provided to

recycle the oil/water waste from the basin to the oil separator. ~~Controls are provided for automatic or manual operation of the pumps based on the level of the retention basin.~~ The WWRB transfer pumps are located in pump sumps adjacent to each compartment. The pumps are manually started and interlocked to stop based on sump level. There are two (one per sump) 100% capacity transfer pumps for each WWRB. The transfer pumps are sized to meet the maximum expected influent flow. The normal pump discharge flowpath is to the blowdown sump. Flow can also be directed to the other Unit's WWRB.

**Blowdown Sump/Plant Outfall**

The blowdown sump is a concrete structure and is open to the atmosphere. It is a common sump and accepts waste water from both Units' WWRBs, CWS cooling tower blowdown from both Units and sanitary waste effluent. In the absence of CWS cooling tower blowdown, RWS supplies an alternate source of dilution water. The outfall pipe is sized with adequate capacity to gravity drain the blowdown sump at the highest anticipated influent flow rate. Wastewater and blowdown effluent from the blowdown sump drains by gravity to Parr Reservoir via the plant outfall piping. Location of the plant outfall routing is shown on FSAR Figure 1.1-202.

**ASSOCIATED ATTACHMENTS:**

None