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Subject: **V. C. Summer Station Groundwater Action Plan**

Date: **August 4, 2006**

To: **Mr. John Zeiler**
Senior Resident Inspector

From: **Jeffrey B. Archie**

Please find attached a copy of the V. C. Summer Station Groundwater Action Plan. The purpose of this action plan is to implement action 1 of the Groundwater Protection Initiative set forth by NEI NSIAC that required each member company to identify and schedule implementation of a site specific action plan.

If you have any questions concerning this plan, please contact Paul Mothena at 803 345-4642.

cc: P. Mothena
M. Coleman
RTS C-06-1912

R-4

V C SUMMER STATION
GROUNDWATER ACTION PLAN

JULY 24, 2006

Background/Purpose

The purpose of this action plan is to implement action 1 of the Groundwater Protection Initiative set forth by Nuclear Energy Institute (NEI) Nuclear Strategic Issues Advisory Committee (NSIAC) that requires each member company operating a nuclear power plant identify and schedule implementation of a site specific action plan. The action plan is to help assure timely detection and effective response to situations involving inadvertent radiological releases in groundwater to prevent migration of licensed radioactive material offsite and quantify impacts on decommissioning.

These actions are in response to a number of industry events related to the inadvertent releases of radioactive materials (primarily tritium) into groundwater that could reach drinking water sources. A public trust issue has developed due to deficiencies in assessing and reporting these releases.

Objectives

- Improve public trust and confidence in the station commitment to environmental stewardship

To enhance the public trust and confidence in the station commitment to environmental stewardship, Summer Station has met with the SC Department of Health and Environmental Control (SCDHEC) Bureau of Radiological Health NRC Liaison, and each of the surrounding counties' emergency preparedness directors representatives in an open forum communicating our status with respect to the groundwater initiatives.

- Identification of potential leakage pathways

The station program and methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.

1. *Liquid Radioactive Waste Effluent Monitoring and Detection* - The primary discharge point for liquid radioactive waste after processing is the Fairfield Pumped Storage penstocks. The liquid effluent discharge is routed through a buried double wall pipe that passes through manholes containing leak collection pots and level switches. Automatic discharge valves are located at each penstock with their own individual containment structures to collect any potential leakage.

   If an increase in level is detected in the collection pots, an annunciator is actuated to notify plant personnel of a potential leak. The affected level switch pot(s) is then drained and tested for radioactivity to determine if additional action is necessary. In accordance with established preventive maintenance procedures, each manhole is inspected monthly and each discharge valve containment structure is inspected quarterly for potential leakage. Any identified leakage is collected, tested and processed in accordance with plant procedures.

2. *Spent Fuel Pool Leakage Monitoring and Detection* - There are nine monitoring points for leakage from the Spent Fuel Pool liner. These "tell tales" drains are monitored quarterly in accordance with plant surveillance procedures.

3. *Steam Generator Blowdown to the Circulating Water System* - An alternate path is provided for steam generator blowdown to the Monticello Reservoir via the return piping for the Circulating Water System. In the event high radioactivity is detected, a radiation monitor will terminate this discharge. This release path is not a direct communication to groundwater.

4. *Refueling Water Storage Tank (RWST) Pit Collection and Monitoring* - Rainwater and/or any leakage which would collect in the RWST Pit is collected and pumped into the RWST Pit Drain Tank. The liquid is sampled and either released or processed as radioactive waste. The RWST Pit Drain Tank is located in a curbed area where any leakage from it would be contained and drained back to the RWST pit sump for processing.

5. *Condensate Storage Tank (CST) and Piping* - The CST is located within the plant's Protected Area and is monitored by operations personnel each 12 hour shift for any abnormalities and leaks. Additionally, the tank level is recorded using two CST level instruments each 12 hour shift.

   The Emergency Feedwater and Condensate System Engineers also perform periodic walkdowns of the CST area to look for any abnormalities, including leaks. A composite of samples collected daily from the outfalls from yard storm drains are monitored monthly per the Radiological Environmental Monitoring Program (REMP).

6. *Turbine Building Sump Discharge* - Non-radioactive wastes from the Turbine Building, Intermediate Building and Tendon Access area are collected in the Turbine Building Sump. A liquid radiation monitor is provided to automatically terminate discharge from this sump if its set point is reached. A continuous composite sample is collected and analyzed weekly and tracked in the Radioactive Effluent Tracking System. Wastes from this sump are sent to an outside collecting sump and then forwarded to the Plant Waste Surge Basin for eventual discharge. Monitoring of leakage from the Plant Waste Surge Basin is performed in accordance with the REMP.

7. *Condensate Polisher Backwash and Disposal* - During plant startup and up to 50% reactor power, a condensate polisher is used to remove ionic and particulate impurities from the condensate. The condensate polisher resin is removed by backwashing after it is exhausted. This resin slurry is collected in a tank and after sampling for radioactivity is normally pumped to the Alum Sludge Lagoon where the resin settles out and the liquid is discharged. If radioactivity is present, the resin slurry is sent to a high integrity container where it is dewatered and the resin disposed of as radioactive waste. During transfer of the resin slurry to the Alum Sludge Lagoon, a radiation monitor continuously monitors the slurry and will terminate the transfer if its set point is reached. Monitoring for leakage from the Alum Sludge Lagoon is performed in accordance with the REMP.

- <u>Assessment of the adequacy of the current groundwater monitoring program.</u>

Summer Station has three (3) onsite groundwater monitoring wells included in the REMP and sampled quarterly and analyzed for radionuclides (including tritium). These wells include:

1. Two (2) onsite wells within 200 yards of the plant as required by the Offsite Dose Calculation Manual (ODCM).
2. One (1) onsite well located near the site boundary in the quadrant of our Maximum Exposed Individual.

In addition, VCSNS samples the local municipal drinking water system monthly.

VCSNS has 16 additional onsite wells which are not currently included in the REMP that are sampled semiannually and analyzed for radionuclides (including tritium). These wells include:

1. Five (5) onsite wells used for monitoring near the Waste Treatment Ponds.
2. Eleven (11) additional onsite wells installed for groundwater remediation.

Listed in the table below are the nuclides required by the ODCM to be monitored and the respective counting sensitivity, along with the highest minimum detectable activity (MDA) reported in 2005.

Nuclide	ODCM required LLD (pCi/l)	Max MDA reported 2005 (pCi/l)
H-3	2000	566.00
Mn-54	15	3.49
Co-58	15	3.67
Fe-59	30	6.90
Co-60	15	3.93
Zn-65	30	7.86
Zr-95	30	4.69
Nb-95	15	6.29
Cs-134	15	3.52
Cs-137	18	3.50
Ba-140	60	15.30
La-140	15	6.47

The current groundwater sample locations are adequate for early identification of groundwater contamination. The ODCM will be revised to incorporate current groundwater samples and establish a quarterly sample frequency to aid in the detection of contamination prior to its migration from the site.

- Development of a corrective action protocol

The station record keeping (SAP-126, Transmittal of Records and Documents) and corrective action (SAP-999, Corrective Action Program) protocols are contained in site procedures and any incidents will be documented in the corrective action program for proper management.

- Development of a communication protocol

VCNS has augmented its communication tools (Nuclear Licensing Procedure NL-122, Regulatory Notification and Reporting and Nuclear Licensing Guideline 117 "Guideline for Potential Public Interest Events") to include inadvertent radioactive releases to ground water. VCSNS will inform national, state, and local parties of interest when the following threshold criteria are reached:

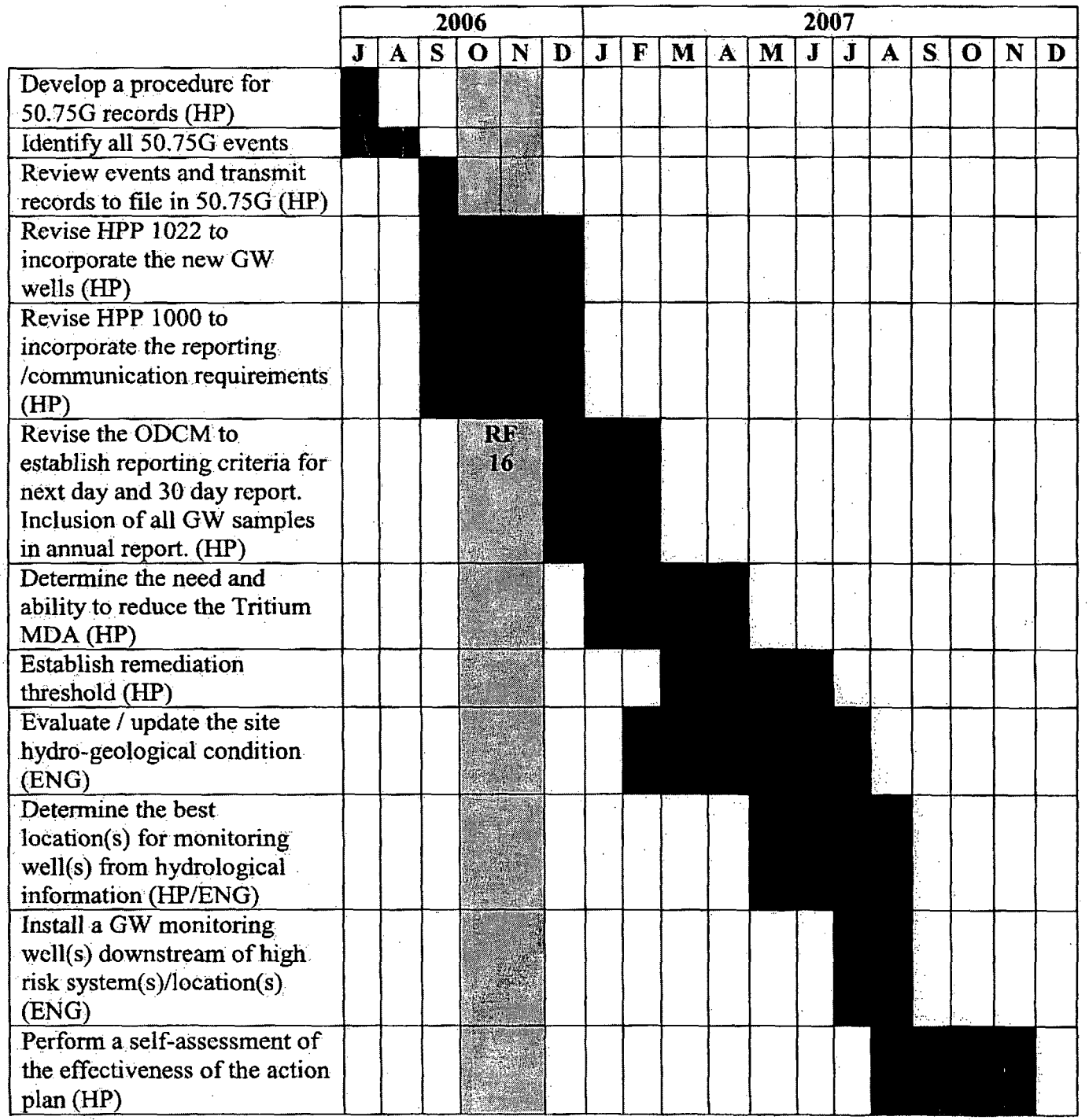
1. A radioactive leak or spill that exceeds 100 gallons or of an unknown volume.
2. All leaks, regardless of volume or activity from a high risk system or component (e.g. spent fuel pool or outdoor refueling water storage tank) and can potentially get into groundwater.
3. A water sample from offsite groundwater or surface water which exceeds the reporting criterion for water provided in the Offsite Dose Calculation Manual (ODCM).
4. A water sample from an onsite groundwater monitoring well or surface water that is hydrologically connected to groundwater that exceeds the reporting criterion for water in the ODCM.

- Organizational Structure:

A diverse site team was established utilizing expertise from Design Engineering, Plant Support Engineering, Nuclear Licensing, Health Physics, Emergency Planning, and Operations with the Station Manager as the executive sponsor, and the Radiation Protection Manager as the Project Lead.

Design and Plant Support Engineering disciplines focused attention on system health and risk assessments of potential flow paths to groundwater. Health Physics addressed monitoring for early indication and reviewed current and past analyses for possible groundwater contamination events. Health Physics is responsible for environmental sampling and effluents at VCNS. Nuclear Licensing established procedures for reporting of an event and identified the outside stakeholders. The outside stakeholders were identified as SCDHEC, and surrounding county emergency preparedness directors. . Emergency Planning coordinated the communications with the local county representatives. Operations reviewed system procedures and operator rounds to identify methods to prevent and identify system leakage. Functional managers are responsible for allocating resources. Coordination of actions is maintained through the station's corrective action program (CER 06-1912).

GPI Action Plan Milestone Schedule



( ) Represents action item owner group

ONSITE GROUND/SURFACE WATER MONITORING QUESTIONNAIRE

Onsite Radiological Effluent/REMP Monitoring Program

Phase I (Near term response)

1. Does the licensee have radioactive groundwater monitoring wells onsite?	**Yes**
If YES: How many wells:	**Eight ground water wells. 3 REMP & 5 NPDES**
Where are they located (e.g., distributed around/throughout the site, in a particular region of the site and/or near particular buildings/structures, etc.)	**Two wells are located near the plant but outside the Protected Area. (~500 ft from centerline of RB)** **One is located near the site boundary beyond the waste water ponds.** **Five NPDES wells are located around the waste water ponds.**
(a.) within the Protected Area	**No**
(b.) within the Radiologically Restricted Area	**No**
(c.) within the owner-controlled area	**Yes**
(d.) at what frequency does the licensee sample/analyze the wells	**REMP – Quarterly** **NPDES – Semi-Annually**
(e.) for what radionuclides does the licensee monitor	**Mn-54, Fe-59, Co-58, Co-60, Zn-65, Zr-95, Nb-95, I-131, Cs-134, Cs-137, Ba-140, La-140, H-3.**
2.If the licensee does NOT have an onsite radioactive groundwater monitoring program:	**N/A**
3. Does the licensee have a french drain system surrounding the main reactor facility and auxiliary structures?	**No**
4. Does the licensee have a surveillance program to periodically :	
(a.) walkdown outside areas around the site to look for potential leaks and spills?	**The liquid waste systems are not classified as "Risk Significant" or "Important to Maintenance Rule". Therefore, the LW and WL systems are "Unassigned" and walk-downs are not routinely performed by Plant Support Engineering. However, during walk-downs of other systems, PSE and the supporting groups do look for any abnormal conditions which would include leaks, spills, etc. and initiate corrective actions where necessary.**
(b.) pressurize buried radwaste lines to evaluate structural integrity and evaluate potential for leaks and spills?	**Liquid radwaste from the plant is discharged through a 3" pipe to the Fairfield Hydro Penstocks. The 3" pipe is covered by a 6" guard pipe as shown on drawing 302-362. The**

	guard pipe is sectioned off into 10 sections between the plant and the penstocks. Each section of the guard pipe drains into a level switch pot and any level switch which is actuated due to water accumulation will actuate an alarm on the radwaste panel in the Auxiliary Building. There is a quarterly PM to check each level switch drain pot for any water accumulation. Also, there is a refueling PM to check leakage of any waste system components which have been worked on.
5. Does the licensee perform any other onsite monitoring (e.g. soil sampling) to identify unexpected radioactive releases	**Yes** **Composite water and sediment samples at the two site out falls.** **Soils sampling at the waste oil incinerator.**
6. Does the licensee's radioactive liquid discharge line traverse any non-licensee owned areas (e.g., it is on a right-of-way surrounded by private properties)?	**No**
7. If the licensee has a discharge pipe that runs underground or any underground piping that carries radioactive liquids, does the licensee perform monitoring along the discharge pathway to identify potential leakage.	**No**
8. Historical Onsite Radioactive Contamination: (a.) Does the licensee have any history of radioactive spills and/or leaks outside of buildings/structures? Are they documented in 10 CFR 50.75g file?	**No**
(b.) Has the licensee identified onsite radioactive groundwater contamination?	**No – VCS has not detected any activity above the LLD levels as defined in the ODCM.**
If YES: When was it identified - IF known:	N/A
LER/Abnormal Event Report/Condition Report Nos:	N/A
To what extent - IF known [square footage, estimated ground depth of the contamination, estimated quantity (volume / concentration)	N/A
Has the contamination moved outside the Restricted Area or the owner-controlled area?	N/A