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SUBJECT: Forwards rev 13 to procedure C-110, "Collecting Initial Set of Post Accident Samples & Guidelines for Establishing Post Accident Water & Gas Inventory Control." Procedure reissued to reflect refs to procedures 1-COP-65.71 & 1-COP-06.02.

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CATEGORY 1 DOCUMENT

Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957

April 1, 1998

L-98-78
10 CFR 50 Appendix E

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Emergency Plan Implementing Procedure

In accordance with 10 CFR 50 Appendix E, enclosed is one copy of an amended procedure which implements the Emergency Plan.

Number	Title	Revision	Implementation Date
C-110	Collecting Initial Set of Post Accident Samples and Guidelines for Establishing Post Accident Water and Gas Inventory Control	13	March 11, 1998

This procedure has been reissued to reflect references to procedures 1-COP-65.71 and 2-COP-06.02 for reactor coolant samples in Step 8.6.

Should there be any questions on this revision, please contact us.

Very truly yours,

J. A. Stall
Vice President
St. Lucie Plant

JAS/spt

Enclosure

cc: Regional Administrator, Region II, USNRC (2 copies)
Senior Resident Inspector, USNRC, St. Lucie Plant (w/o)

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT
CHEMISTRY PROCEDURE NO. C-110
REVISION 13

1.0 TITLE:

COLLECTING INITIAL SET OF POST ACCIDENT SAMPLES AND GUIDELINES FOR ESTABLISHING POST ACCIDENT WATER AND GAS INVENTORY CONTROL

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group 3/31 1981

Approved by C. M. Wethy Plant General Manager 4/9 1981

Revision 13 Reviewed by F R G 2/24 1997

Approved by J. Scarola Plant General Manager 2/24 1997

3.0 PURPOSE:

3.1 To provide priority guidelines for obtaining essential samples following a Loss of Cooling Accident (LOCA) or other abnormal event.

3.2 To provide guidelines, as per Appendix A, that identify possible areas of concern for a long term surveillance program in the weeks following the incident.

4.0 PRECAUTIONS AND LIMITS:

4.1 No samples will be taken for outside agencies without the concurrence of both the Emergency Control Officer and the Chemistry Supervisor.

4.2 This procedure only outlines the sequence of samples that are desirable to evaluate an abnormal event. The actual situations existing at the time may dictate another course of action, for example: 1) more or less samples than procedure dictates. 2) only those samples that the Operational Support Center (OSC) can support for manpower or personnel safety concerns.

4.3 HIGH RADIATION AREAS should be assumed to be present when obtaining liquid or gaseous samples. Radiation survey instruments and dosimeters should be observed frequently while purging and drawing samples.

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4.0 PRECAUTIONS AND LIMITS: (continued)

4.4 IF HIGH RADIATION LEVELS are encountered, the sample gathering should be divided up among personnel on site or delayed as personal exposures dictate.

4.5 No area should be entered without adequate survey instruments, Health Physics approval and Health Physics approved Exposure guidelines.

4.6 All samples should be marked with a discrete identification number and tracked via the Post Accident Sample Inventory Data Sheets or on the LIMs Computer Data Base.

4.7. All liquid samples leaving the Reactor Auxiliary Building should be double bagged, preferably with enough absorbent material in the inner bag to match the container volume.

4.8 The following samples require special considerations depending on accident type:

1. Reactor Coolant Loop Sample Line Solenoid Valves will shut on Containment Isolation Signal (CIS). CIS must be cleared or valves overridden to regain control to reopen these valves. RCS pressure is also required for the driving force to get sample.

2. Containment air samples should be taken from POST LOCA Hydrogen monitor if containment monitor is isolated by CIS. On Unit 2 the PASS system can be used also to draw a containment air sample.

3. The Steam Generator (S/G) Blowdown Sample Lines are shut by a common controller on CIS. Both will reopen at the same time if CIS clears and the switch goes from AUTO to OPEN by operator control.

4. Shutdown Cooling Combined Low Pressure Safety Injection (LPSI) will:

   A. Maintain suction on the Refueling Water Tank (RWT) until RWT Level drops to its setpoint level where LPSI goes on Containment Sump Recirculation, or

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4.0 PRECAUTIONS AND LIMITS: (continued)

4.8 (continued)

4. (continued)

B. The LPSI Pump Discharge could possibly be on normal shutdown cooling alignment depending on the size/location of the RCS leak.

C. The flowpath of LPSI should be verified with the Reactor Control Room prior to sampling in any case.

4.9 The following should be lined up to Reactor Auxiliary Building Hot Drains or isolated shut with caution tags, prior to reopening containment isolation closure valves:

1. Steam Generator Blowdown Sample Line Valves to Cold Lab at Turbine Building.

2. Unit 1 Steam Generator Blowdown Flash Tank Isolation Discharge Valve to Discharge Canal.

3. Steam Generator Main Blowdown to Blowdown Building should be left shut until the RCS to Secondary Side Primary Leak Pathway has been verified to be zero leakage.

4.10 If a sample requires a purge time, leave the area while the purge is in progress to reduce exposure. Sample containers should be prepared with measured dilution water prior to sample time to reduce handling time on hot samples.

4.11 The Plant General Manager or his designee shall review any batch effluent release request that would exceed the C-200, "Off-site Dose Calculation Manual," Controls and/or EPA Reportable Quantities as per C-72.

4.12 The Chemistry Supervisor shall establish the frequency for the checks described in this procedure. The frequency may only be changed by the Chemistry Supervisor as conditions dictate.

4.0 PRECAUTIONS AND LIMITS: (continued)

4.13 Process Monitors on Effluent Streams should be checked prior to the beginning of a batch release and should be closely observed during the initiation of a release.

5.0 RELATED SYSTEM STATUS:

5.1 Radwaste Management System Operable

5.2 Normal Reactor Auxiliary Building (RAB) Ventilation System Line Up.

5.3 Process Monitoring System Operating.

5.4 Component Cooling Water (CCW) System to Sample Coolers.

5.5 Post Accident Sampling System.

6.0 REFERENCES:

NONE

7.0 RECORDS REQUIRED:

7.1 Normal Log Entries on Chemistry Logs.

7.2 The completed Data Sheet from this procedure shall be maintained in the plant files in accordance with QI 17-PR/PSL-1, "Quality Assurance Records."

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8.0 INSTRUCTIONS:

8.1 If the abnormal event occurs during off-hours, contact the Technical Support Center or Control Room as soon as you arrive on site.

8.2 Establish the Plant Status and verify OPERABILITY (including sampling pumps as applicable) of process monitors and check the following pathways to ascertain if an abnormal release is in progress:

ST. LUCIE UNIT 1 or 2

Plant Vent

Fuel Building

ECCS Vent A + B

Air Ejector (A.E.) Exhaust

Steam Line

S/G Blowdown Bldg Vent

S/G Liquid Blowdown

Containment

If CIS has occurred turn off both Containment Monitor Pumps and post a sign on the monitor that it is out of service.

8.3 If other members of the Chemistry Department are on-site and a Site Area Emergency has occurred, have someone start setting up a remote lab if one is required. Chemistry procedure C-111 describes the set-up of a remote Chemistry Lab and a Remote Counting Lab. The location of the remote lab will be determined by the Chemistry Supervisor (or the most senior chemistry person on site), taking into account background radiation levels, accessibility of area, power supplies, etc. A Chemistry representative establishing the remote laboratory will stay in the lab while monitoring the noble gas and radiation levels as per 4.5. If increases are noted, follow the instructions of 4.5 or any instructions received from the OSC for evacuation.

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8.0 INSTRUCTIONS: (continued)

8.4 Determine the best location for obtaining a representative sample of water that has circulated through the core region of the Reactor, i.e., RCS Hot Leg, LPSI Reactor Cavity Sump Recirc. or Shutdown Cooling.

8.5 Enter the RAB Hot Lab Area and determine if the Lab can be used for sample analysis.

8.6 Obtain Reactor coolant sample (use 1-COP-65.71 for PSL-1 and 2-COP-65.72 for PSL-2) if necessary.

1. Perform Boron Analysis on sample and perform Gamma Spectrum Analysis. Determining the levels of Fission Product Iodines and Cesiums are the primary concerns.

2. Notify the OSC Chemistry Supervisor as soon as the results are obtained for the above samples. The Dose Equivalent Iodine Technical Specification Sampling Frequency of every four hours should be waived during accident conditions for personnel exposure consideration.

8.7 Obtain a Plant Vent (or Fuel Handling Building if a Fuel Handling Accident) set of Samples as per C-72.

8.8 If a steam line monitor is upscale, the Steam Generators can be checked for primary to secondary leaks, but the results can be affected by:

1. If the Main Steam Isolation Valves are shut, a leaker will show positive indication.

2. If the Main Steam Isolation Valves are open and the Condenser Dumps are being used with Feed Header Flow back to the Steam Generators, both Steam Line Monitors and their blowdown monitors could show positive indication of leakage because the radioactivity will go around the cycle and into the Steam Generator without a leak. The leaker will be the one with the highest mR/hr.

3. Recommend that the Reactor Decay Heat be removed from the non-leaking Steam Generator if a leak is detected. The leaking Steam Generator should not be vented to the atmosphere if possible.

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8.0 INSTRUCTIONS: (continued)

8.9 When conditions permit, consider sampling the following tanks for gross activity. (Holding a Frisker up to the sample bottle is an acceptable method for quick results):

1. Chemical Drain Tank
2. Equipment Drain Tank
3. Aerated Waste Storage Tank
4. Spent Fuel Pool (if Fuel Handling Accident)
5. Main Condenser Hotwell (if primary to secondary leak was confirmed).
6. Other Waste Tanks as applicable from the above tank samples.

8.10 The Component Cooling Water System should be grab sampled if their process monitors showed an increase in count rate. CCW is a direct RCS leak pathway. If a CIS occurred CCW should be grab sampled whenever flow is restored inside Containment.

NOTE
Sodium Molybdate in Waste Tanks in the R.A.B. will deplete Ion Exchanger Beds in short order.

8.11 Line up the Post LOCA Containment Hydrogen Analyzer to take:

1. Containment Gaseous Activity Grab Sample.
2. Containment Iodine Activity Grab Sample
3. Containment Particulate Activity Sample
4. Post LOCA Hydrogen Gas Sample as per 1-COP-06.03, PSL-1 or 2-COP-06.04, PSL-2 /R13

8.12 The Chemistry Supervisor will determine the need for further sampling as per the guidelines of Appendix A of this procedure.

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APPENDIX A
GUIDELINES FOR POSSIBLE AREAS OF CONCERN FOR LONG TERM POST ACCIDENT SURVEILLANCE

This section is written into areas of concern which identify system and building boundaries and the items that should be considered for each.

The Chemistry Supervisor will dictate what tests and scheduling frequency will apply to each area of concern.

The areas of concern are as follows:

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APPENDIX A

I. CONTAINMENT BUILDING (Free Standing Water & Atmosphere):

A. CONCERNS:

1. Estimating the initial inventory of water injected, total inventory in the core and cavity sump and their chemical and nuclide composition.

2. Tracking additions to the containment water volume.

3. Tracking changes in nuclide mixtures that may show core leaching rates.

4. Tracking atmosphere composition for % gases and nuclide concentrations.

5. Projection of recovery based on iodine/cesium.

B. VESSELS AND TANKS OF CONCERN:

Containment Sump

Pressurizer Quench Tank

Reactor Drain Tank

C. ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

1. Penetrations and piping that could pass water in or out of containment.

2. Containment Purge.

3. Hydrogen Purge

D. ACTION TO CONSIDER:

1. Review the data from the initial post accident samples for tank levels and compare it to logs prior to the incident. Use tank strapping data and last boron concentrations to calculate probable containment sump volume and boron concentration. Compare these values to the grab sample values as a cross check.

2. Treat each change in valve line up on lines exiting containment on a case by case basis after careful review of circumstances.

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II. REACTOR COOLANT (Shutdown Cooling):

A. CONCERNS:

1. Spread of contamination to associated systems.
2. Sources of Dilution Water to SDC.
3. SDC Heat Exchanger to CCW Leaks.
4. Makeup Supply to SDC.

B. VESSELS & TANKS OF CONCERN:

Safeguard Sumps.

C. ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

1. RAB Liquid Radwaste System.
2. Make-up water to SDC.
3. Component Cooling Water.

D. ACTION TO CONSIDER:

1. Sample Frequency to ensure no Boron Dilution occurring on SDC system or on its make-up supply.
2. Verify operation of CCW Process Monitors and consider adequacy of grab sampling frequency on CCW.
3. Review SDC flow line up for possible sources of dilution and paths for spreading contamination to Associated Systems.

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III. RAB CVCS LETDOWN SYSTEM:

A. CONCERNS:

1. High levels of radioactive water may be in the RAB side and the Volume Control Tank (VCT) could have a Hydrogen Gas Blanket with high Noble Gas Activity.

2. Improper valve operation could cause parts of these lines to be drained.

3. The boron concentration in this part of the system will be a source of dilution water to the core.

4. The CVCS Ion Exchanger, if lined up to Shutdown Cooling can cause a diluting effect until Boron Equilibrium on the Bed equals inlet boron and the absorption of very high activity on the bed can cause very high radiation levels to build up in excess of design shielding.

B. VESSELS AND TANKS OF CONCERN:

1. Volume Control Tank

2. Flash Tank

3. CVCS IX 1A, PSL-1, CVCS IX 2A, PSL-2.

4. CVCS IX 1B, PSL-1, CVCS IX 2B, PSL-2.

5. CVCS IX 1C (Normal Deborating) PSL-1, CVCS IX 2C PSL-2.

C. ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

1. Hydrogen Cover Gas to the VCT.

2. Nitrogen Cover Gas to the VCT and the Flash Tank

3. Tank Vents to the Gaseous Waste Surge Header.

4. Operating Mode of the Gas Analyzer.

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III. (continued)

D. ACTION TO CONSIDER:

1. The CVCS Ion Exchangers
2. The Hydrogen Cover Gas Supply to the VCT.
3. Nitrogen gas supply to the Flash Tank
4. The Nitrogen supply to the VCT.
5. The CVCS Letdown Gross and Iodine Monitor Channels should be turned off to prevent high count rate damage to the photo multiplier tube.

IV. BORIC ACID RECOVERY SYSTEM:

A. CONCERNS:

1. The Hold-Up Tank (HUT) in service could contain highly radioactive water and gas.
2. Operation of systems off the HUT in service could spread the hot radioactive water to cleaner systems.
3. The HUTs vent relief relieves directly to the Plant Vent. Overpressurization of the in service HUT is a concern if the HUT is determined to contain hot radioactive water.

B. VESSELS AND TANKS OF CONCERN:

1. Hold-Up Tanks
2. Preconcentrator IX
3. Concentrator Bottoms
4. Boric Acid Holding Tank

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IV. (continued)

C ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

1. Nitrogen cover gas to the HUT.

2. Preconcentrator ion exchanger excessive radiation if recirculation lined up to HUT.

3. Operation of Boric Acid Concentrators

D. ACTION TO CONSIDER:

1. Isolate the HUT(s) that were in service.

2. If rate levels permit sampling HUT, assay the tank to determine extent of radioactivity. A radiation survey on the HUT would be preferred before starting the HUT Pump.

3. The rest of the Boric Acid Recovery System should be sampled as the hot radioactive water is detected in the recovery chain.

4. The Condensate Recovery System from the Boric Acid Concentrators should be sampled.

V. GASEOUS WASTE SYSTEM:

A. CONCERNS:

1. Reaching maximum capacity on Gas Decay Tanks (GDTs).

2. Improper valve lineup or venting where oxygen could enter the system creating an explosive hazard or high activity gas could be released to RAB.

3. Nitrogen supply regulators left cut in to non-essential equipment which would fill the GDTs.

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V. (continued)

B. VESSELS AND TANKS OF CONCERN:

1. GDTs
2. Gas Surge Tank

C. ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

1. Gas Analyzer
2. VCT, Flash Tank, HUTs cover gas
3. Operation of the Boric Acid Concentrators

D. ACTION TO CONSIDER:

1. The Gas Analyzer should not be aligned to a highly radioactive gas tank.
2. The Gas Analyzer should be operated as per the Chemistry Supervisor preferably on the Gas Surge Header.
3. The GDT pressure increase should be monitored.
4. Use of one of the HUT cover gas volume could be used as a temporary gas decay tank.

VI. LIQUID WASTE SYSTEMS:

A. CONCERNS:

1. The extent of the spread of highly contaminated water in the RAB.
2. Normal operation of auto starting sump and tank pumps spreading contamination throughout the system (Safeguard Sumps).
3. Exceeding Volume capacity of tanks.

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VI. (continued)

A. (continued)

4. Chemical contaminants (Sodium Hydroxide and Sodium Molybdates PSL-1) (Trisodium phosphates and Sodium Molybdates PSL-2) that deplete ion exchangers.

5. Monitor operation of the RAB Laundry System for volume and contamination from hot laundry.

6. Avoid inadvertent draining of hot sections of piping.

7. Insure proper operation of system alarm functions for high level alarms, etc.

8. Available Dilution Flow for Batch Releases should be checked.

9. High Dissolved Noble Gas activity may cause the Liquid Discharge Monitor to be off range high.

10. Alignment of S/G Blowdown Flash Tank on Unit 1 should be checked.

B. TANKS AND VESSELS OF CONCERN:

1. Equipment Drain Tanks

2. Chemical Drain Tank

3. Waste Condensate Tanks

4. Boric Acid Condensate Tank

5. Waste Monitor Tanks

6. Safeguard Sumps A and B.

7. Waste ion exchanger D.F.s.

8. Boric Acid condensate ion exchanger D.F.s

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C. ASSOCIATED SYSTEMS OF CONCERN:

1. Main Circulating and Intake Cooling Water Pumps.

2. Operation of Laundry and Decon Rooms.

3. Sodium molybdate Systems.

4. Boric Acid Concentrator Heating Steam-condensate Recovery with High NH^{+}_{3} from Auxiliary Boiler.

5. Possible treatment of large volumes from a contaminated secondary system.

D. ACTION TO CONSIDER:

1. Isolate, if possible, any source of highly radioactive water in the RAB waste system.

2. Establish Administrative Control of all RAB water movements including Laundry Operation, Pipe Draining, etc.

3. Request that an adequate number of circulating water pumps be left operable at all times for dilution purposes.

4. Establish Chemistry surveillance of Tank Levels, Tank Radiation Assay, etc., to insure that the environmental release tank does not become a release problem for Effluent Concentration Limits (ECL).

5. Request that any group performing Decontamination work have soap, etc. checked out by Chemistry for ion exchanger compatibility.

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VII. OUTSIDE STORAGE TANKS:

A. CONCERNS:

1. The Tank will overflow to on-site settling basins.

2. The Tank could receive very hot radioactive water posing a radiation problem.

3. The Tank could show an increase in activity and level which may indicate an improper valve line up.

4. The contents of the tank could be drained or diverted to a relatively CLEAN Tank that may compound the problems of containing the spread of the incident.

B. TANKS OF CONCERN:

1. Refueling Water Tank.

2. Primary Water Tank.

3. 1A Waste Monitor Tank Liquid

4. 1B Waste Monitor Tank Liquid

5. Hotwells on Main Condenser.

6. Condensate Storage Tank (C.S.T.)

7. Demineralized Water Tank

8. 1A Monitor Storage Tank

9. 1B Monitor Storage Tank

10. 1C Monitor Storage Tank.

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VII. (continued)

C. ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

1. Main Condensate Reject Valve to Condensate Storage Tank
2. Boric Acid Heating Steam Recovery Condensate return to Hotwells, C.S.T. or Storm Drains.
3. Spent Fuel Pool Transfer Pump Line-Up on Fuel Pool Filter and ion exchanger.
4. Steam Generator Blowdown Radioactivity and Line up.

D. ACTION TO CONSIDER:

1. Caution Tag non-essential equipment power supplies, discharge, drain or cross connect valves as applicable.
2. If a tank is not contaminated, tag out the upstream valve nearest the source of a system that could contaminate the tank.
3. Insure that Operations Department will continue monitoring tank levels on a periodic basis.

VIII. SECONDARY SYSTEMS (IF APPLICABLE):

A. CONCERNS:

1. Containing further spread of contamination.
2. Treatment of large volumes of contaminated water.
3. Restriction of use of chemicals.
4. Direct discharge path to discharge canal via Steam Generator Blowdown.

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VIII. (continued)

B. TANKS AND VESSELS OF CONCERN:

1. Main Condenser Hotwells
2. Non-Leaking Steam Generator
3. Condensate Storage Tank
4. Main Condensate and Feed Systems
5. Turbine Building Drains
6. Settling Basins
7. Blowdown Building Systems S/G Blowdown Flash Tank

C. ASSOCIATED SYSTEMS OF CONCERN:

1. Chemical Addition System

CAUTION
Consideration should be given to minimizing the use of amerzine and ammonia during any steam generator tube leak where a shutdown will start immediately. This will aid in cleanup using ion exchangers.

D. ACTION TO CONSIDER:

1. Operations may cool a leaking steam generator using blowdown to the MST. Vacuum drag to both units will be secured. The contaminated water can be stored in the MST and later pumped to the Unit 1 AWST for cleanup and release or recirced to clean up in the SGBTF and released from the MSTs.

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VIII. (continued)

D. (continued)

2. Operations may be forced to continue steaming to the main condenser to cool a leaking steam generator. Condensate reject to the CST should not be used to minimize further spread of contamination. Storm basins should be sampled and posted as contaminated from turbine building drains. After cooldown and isolation of the main condenser, activity levels can then be determined to define the actions necessary to process the waste water. Review and isolate systems connected to the condensate and feed system to prevent further spread of contamination (i.e. isolate loop seal fill to CST; isolate integral groove fill and switch to demin water fill; isolate condensate fill to chem add tanks).

3. Contaminated water in the main condenser could be used to flush the higher contaminated water in the steam generator using the wet layup system pumps to move the water from the condenser to the generator. The generator can be drained to the waste system or the canal depending on activity levels.

4. Other alternatives for handling contaminated water should be decided by the Chemistry supervisor and Emergency Coordinator to prevent exceeding ODCM limits. Actions will be on a case by case basis depending on the accident situation.

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IX. OUTSIDE STREAMS:

A. CONCERNS:

1. The discharge canal, intake canal and East and West Settling Basins are areas where radioactivity could accumulate.

2. The Intake Canal could see ocean water recirculation (from the outfall of the discharge pipes to the intake structure) of normal radioactive discharges.

3. If activity reaches the settling basins, the ponds should be posted.

B. VESSELS AND TANKS OF CONCERN:

1. Overflow of outside tanks to storm drains.

C. ASSOCIATED SYSTEM EQUIPMENT OF CONCERN:

N/A

D. ACTION TO CONSIDER:

1. If the secondary system is contaminated, consider the Settling Basins as radioactive and post accordingly. Each basin should be inspected for any basin dewatering pumps. Any such pump should be tagged out, in a safe condition, to the Chemistry Supervisor.

2. Consider using the maximum dilution flow available during and for four (4) hours following each liquid release.

3. Consider notifying the State of Florida of the periods of batch releases that occur.