RAD EFFLUENT OFF NORMAL CONDITIONS

PROCEDURE USAGE REQUIREMENTS-		SECTIONS
Continuous Use:	Procedure must be open and readily available at the work location. Follow procedure step by step unless otherwise directed.	
Reference Use:	Procedure or applicable section(s) available at the work location for ready reference by person performing steps.	**ALL**
Information Use:	Available on plant site for reference as needed.	

REFERENCE USE

1.0 PURPOSE

This procedure provides instructions for the control of radiological effluents during off normal conditions of radioactivity being present in normally non-radioactive systems.

2.0 DEFINITIONS

2.1 Confirmed Activity - Confirmed radioactivity present in amounts above the minimum detectable concentration (MDC) for the counting configuration used.

3.0 PRECAUTIONS

3.1 Whenever confirmed activity is found in normally non-radioactive systems or areas, immediately notify Operations Department and the Health Physics Department.

3.2 If non-radioactive systems become contaminated, further use of the system shall be restricted until the cause is identified, corrected and the system decontaminated. If it is considered necessary to continue operation of the system as contaminated, a 50.59 evaluation of the operation of the system as radioactive must be performed in accordance with 10 CFR 50.59.

3.3 Secure all other input flows to the Waste Water Retention Basin when making batch effluent releases from the WWRB.

3.4 All appropriate Health Physics controls shall be observed when responding to off normal radioactivity occurrences.

3.5 All applicable NPDES requirements must continue to be met when making effluent releases during off normal radioactivity situations.

3.6 Once a normally non-radioactive system becomes contaminated it must be treated as radioactive until such time as three consecutive samples show no activity above the MDC for the counting configuration used.

4.0 PROCEDURE

4.1 PRIMARY TO SECONDARY LEAK

Upon confirmed primary to secondary leakage the following environmental effluent and in plant actions should be taken to monitor control and minimize plant impacts.

4.1.1 The Turbine Building Condenser Air Ejector and Steam Exhaust and the Waste Water Retention Basin for the associated unit become effluent release points. Obtain samples and perform analysis required by the ODCM Tables 2 - 3 (Liquids) and 3 - 3 (Gases). Initiate effluent permits per Procedures 36015-C, "Radioactive Liquid Effluent Release Permit Generation And Data Control - Computer Method" or 36020-C, "Radioactive Gaseous Effluent Release Permit Generation And Data Control - Computer Method".

NOTE

Verify with Operations Department that the WWRB's are lined up one per unit and not cross connected.

4.1.1.1 Sampling of the Condenser Air Ejector and Steam Exhaust should utilize volume (SCF) estimated for the time period since the leak occurred and not the total time period since filters were placed into the monitor. Approximate time of leak can be best established by reviewing the trend of Condenser Air Ejector and Steam Exhaust activity on the DRMS Computer System for a marked increase in monitored activity.

4.1.1.2 New filters/cartridge placed into the Condenser Air Ejector and Steam Exhaust Monitor as part of this sampling should be analyzed approximately 12-24 hours later depending on activity level to obtain more concise numbers to update the continuous release permit with.

4.1.1.3 Additional sampling on the continuous release permit should be performed about once per 12 hrs. or when there is a sustained activity change of greater than 25%, either increase or decrease (refer to Procedure 36020-C, "Radioactive Gaseous Effluent Release Permit Generation And Data Control.") If the activity of the liquid or gas stream increases by the following, update the continuous release permit to reproject the new dose.

Total gamma - emitting Activity, µci/cc	Factor of increase%
$\leq 10^{-5}$	300
$10^{-5} \leq 10^{-4}$	50
$\leq 10^{-4}$	25

4.1.1.4 Continuous releases from the WWRB require 12000 gpm minimum dilution flow at the blowdown sump, ensure Operations Department is aware of and providing sufficient flow to achieve this criteria.

4.1.1.5 Flow rates used in processing the WWRB continuous release permit are 800 gpm or 1600 gpm depending on how many WWRB pumps are used (1 or 2).

4.1.2 If Steam Generator blowdown is not aligned to the environment, discharges from the WWRB may be treated on a batch basis by sampling all input sources to the WWRB for activity and summing up the activities for all discrete additions to an isolated WWRB (See Figure 2). When the WWRB is filled, a discrete batch discharge may be made per the provisions of Procedure 36015-C "Radioactive Liquid Effluent Permit Generation And Data Control". With the exception of the first discharge outlined below; all sampling must be done at the source of input to the WWRB. If batch releases are going to be made, immediately upon identification of secondary activity secure all sources of input to the WWRB in order to control inputs to the WWRB. Sample the WWRB after recirculation is established to obtain an estimate of activity that may have already gone into it. Process a batch release permit based on this sample. Prior to making the batch release, collect composite samples and empty compositor of contents, and return to operation. During this first batch release following primary to secondary leakage the composite sample collected should be analyzed and used as the actual release activity to close that batch release permit. All subsequent batch releases should have pre-release activity values of the summed input used, the composite sample activities collected and analyzed for each discrete batch release should then be used for the post release permit close out.

4.1.3 During periods of primary to secondary leakage, Steam Generator blowdown should be routed to the hotwell through the Blowdown Demineralizer Clean Up System. Condensate should be routed through the Condensate Polishers. This philosophy will allow the purest possible feedwater to the Steam Generators without excessive feed and bleed, thereby minimizing liquid radwaste loading. This also allows removal of the maximum amount of activity from the secondary cycle to resins which are then handled as radwaste.

4.1.3.1 Notify HP and all Chemistry personnel that areas surrounding Steam Generator Blowdown Demineralizers and Condensate Polishers will be increasing in dose rate commensurate with the activity loaded.

4.1.3.2 Notify HP and all Chemistry personnel that the Turbine Plant Sampling System (TPSS) is contaminated and that cation resin columns on the TPSS will be concentrating activity thus raising dose rates in the area. Appropriate Health Physics controls should be established in the Turbine Building Laboratory.

4.1.3.3 Because the steam generator blowdown trim heat exchanger is cooled by TPCW, there is a potential for contamination of TPCW if there is a primary to secondary leak and if the trim heat exchanger is valved in. For this reason, samples of TPCW should be taken every 24 hours and analyzed for contamination. Sample valves 1405-X4-005 or 1405-X4-006 may be used unless Lab supervision directs otherwise. If TPCW is contaminated, a continuous release permit will probably be required, unless steps are taken to isolate the source of contamination.

4.1.4 Inputs to the WWRB to be quantified if the WWRB is being handled as a batch release point or monitored as directed by supervision when the WWRB is being handled as a continuous release point, include the following:

- Emergency Diesel Generator A Sump (374 gal)
- Emergency Diesel Generator B Sump (374 gal)
- Turbine Building Drain Tank (18,000 gal)
- Auxiliary Feedwater Sumps (1840 gal)
- Control Building Drain Sump (2,400 gal)
- Clean Water Sump (1170 gal)

Ensure the Operations Department has placed the tank/sump to be sampled on recirculation prior to obtained samples. A minimum of 1 hour recirculation should be obtained prior to sampling.

4.1.5 Sampling and effluent controls should continue on the Condenser Air Ejector and Steam Exhaust and the WWRB until activity is no longer detected above the MDC values for the counting configuration used on three consecutive samples. (MDC Values of ODCM requirements shall as a minimum be met).

4.2 PRIMARY TO CCW OR ACCW LEAKAGE

4.2.1 If confirmed activity is found in the CCW or ACCW system, other than Na-24 at levels $\leq 10^{-7}$ µci/cc on the routine chemistry sample immediately notify the Operations and HP Departments. If Operations notifies Chemistry of an indication of primary to CCW/ACCW leakage or the Rad Monitor Alarms, sample and analyze the CCW and (or ACCW) system to quantify activity present.

4.2.2 Sample the NSCW system to determine if any activity has further leaked into the NSCW system.

NOTE

CCW and ACCW systems are at lower pressure than NSCW and leakage normally would not be expected from CCW or ACCW to NSCW.

If activity is found in the NSCW System concurrently perform Section 4.3 of this procedure.

4.2.3 Notify Health Physics of CCW or ACCW activity and request Operations/Health Physics walk down the CCW and/or ACCW System piping to identify leakages.

NOTE

Approximate system leak rate should be known by chemical usage over the few weeks previous to the radioactivity occurrence.

Request Operations monitor CCW or ACCW surge tank level to help determine respective system leak rate.

4.2.4 Use appropriate Health Physics practices when sampling or adding chemicals to the CCW or ACCW system. Consider setting up appropriate CCW/ACCW test stands in the primary laboratory to minimize contamination spread.

4.2.5 Notify Operations Department to hold CCW drain tank contents until samples are obtained. Handle as radwaste if activity is present.

NOTE

If handled as radwaste, notify the radwaste group of the chemical constituents that CCW will contain.

4.2.6 All components in the CCW and ACCW systems are located in the auxiliary building, no effluent releases should occur as a result of CCW or ACCW contamination.

4.2.7 Continue to monitor CCW, ACCW and NSCW for activity a minimum of once per week as scheduled in Procedure 30025-C, "Periodic Analysis Scheduling Program".

4.3 NSCW ACTIVITY

4.3.1 If activity is found in the NSCW during routine sampling immediately notify Operations and Health Physics Departments. If Operations Department notifies the Chemistry Department of indications of NSCW boundary breach or the NSCW Radiation monitor alarms, obtain sample of the NSCW and analyze to quantify activity present.

4.3.2 Sample the CCW and ACCW systems to determine if they contain activity and are the source of input of activity to the NSCW system, or have been contaminated by the NSCW system.

NOTE

CCW and ACCW systems are at lower operating pressure and normally any system boundary breach would allow leakage from NSCW to the CCW or ACCW systems.

4.3.3 If NSCW is blowing down to the blowdown sump, verify that the radiation monitor has terminated blowdown. If it has not, immediately secure the blowdown. Review DRMS computer data for indication of when activity became present in the system. Based on this information, process a batch release permit per Procedure 36015-C "Radioactive Liquid Effluent Release Permit Generation And Data Control" for the time period of the release based on activity of the sample taken. This is to account for the low level activity released prior to the radiation monitor actuation securing the blowdown. Provisions must be made to monitor for Noble Gas, Particulate and Iodine Activity on the NSCW Tower Air Fan Exhaust to atmosphere, as evaporation provides possible airborne releases. Variables such as evaporation rate, partitioning coefficient factors, etc. to be determined by Laboratory Supervision.

4.3.4 Request Health Physics and/or Operations walk down the NSCW system to identify radiological problems from system leakages. Verify no additional unmonitored release to the storm drains exist by sampling standing water in storm drains in the area of the NSCW components for activity.

4.3.5 Use appropriate Health Physics practices when sampling or adding chemicals to the NSCW system. Consider setting up appropriate NSCW analytical test stands in the primary laboratory to minimize contamination spread.

NOTE

The NSCW chemical addition building will become a potentially contaminated area, request Health Physics monitor and set up appropriate controls.

4.3.6 If chemical conditions in the NSCW system require, continued blowdown, process a continuous release permit per the provisions of Procedure 36015-C, "Radioactive Liquid Effluent Permit Generation And Data Control".

4.4 ELECTRIC STEAM BOILER CONTAMINATION

4.4.1 The Electric Steam Boiler is sampled for activity during startup and shutdown, to detect leakage from the waste or boric acid evaporator steam coil drains which are recycled back to the Electric Steam Boiler as feedwater.

4.4.2 Electric Boiler blowdown, boiler drains and building floor drains go to the Turbine Building Oil Water Separator System. Blowdown from the electric boiler is automatic to control conductivity (hence heat input) to the boiler.

4.4.3 Upon identification of activity in the Electric Steam Boiler immediately request Operations Department shutdown the electric boiler. Notify Health Physics.

4.4.4 Sample and analyze the Turbine Building Oil Water Separator to determine the extent of activity.

4.4.5 Sample and analyze the WWRB to determine the extent of radioactivity. If radioactivity is present in the WWRB refer to Section 4.1 for permitting of releases from the WWRB.

4.4.6 If radioactivity is only as far as the Turbine Building Oil Water Separator, request Operations handle the water as rad waste rather than discharging it. If discharges are necessary refer to 4.4.5 above.

4.4.7 Continued operation of the Electric Boiler will require a continuous release permit from the WWRB, this would result in increasing contamination of the Turbine Building Drain Systems and is not recommended until the source of activity into the Electric Boiler is identified and corrected.

4.5 TANK MOATS AND SUMPS

4.5.1 The following tank moats and area sumps may discharge to the site storm drain system:

a. Main Steam and Feedwater Tunnel Sumps (pumps 1(2)-1215-P4-018 and 1(2)-1215-P4-012)

b. Auxiliary Feedwater System Sump (pumps 1(2)-1215-P4-020 and 1(2)-1215-P4-021)

NOTE

AFW sumps can be lined up to the Turbine Building Drain System, verify lineup with Operations Department.

c. Electrical Tunnels from the Control Building to the Diesel Generator Building (pump 1(2)-1215-P4-014 and 1(2)-1215-P4-013)

d. RMWST Valve Room, Degasifier Skid and Tank Moat

e. RWST Tank Moat

4.5.1.1 The above moats and sumps are not normally sampled prior to each discharge with the exception of the RWST Tank Moat. It will be sampled by Health Physics and analyzed for gross activity prior to every discharge. Health Physics will sample the remaining moats and sumps when an event within the plant makes radioactivity likely in the particular moat or sump in question or if the moat or sump becomes contaminated.

4.5.1.2 If activity is detected by Health Physics, sample the storm drain water at a location as near to the moat as possible in order to determine if any activity has been previously released. If activity is present in the storm drains refer to Section 4.6 of this procedure.

4.5.2 The Control Building Sump is pumped to the Turbine Building Drain Tanks and is monitored by DRMS monitors.

4.5.2.1 Upon receiving an alarm from the Control Building Sump Radiation Monitor, Chemistry should obtain samples of the sump for activity. Sample the WWRB to determine if any activity is present in the WWRB.

4.5.2.2 If activity is present, recommend Operations Department process the remaining volume to the liquid radwaste system.

4.5.2.3 If activity is detected in the WWRB or if Operations Department intends to continue pumping sump contents to the WWRB, appropriate batch release permits should be initiated per Procedure 36015-C, "Radioactive Liquid Effluent Permit Generator And Data Control".

4.5.3 The following unmonitored sumps pump to the Turbine Building Drain System:

a. Auxiliary Feedwater System Sump

b. Auxiliary Building Clean Water Sump

4.5.4 Sumps listed above should be sampled prior to pumping (see Note below) to detect activity present. If activity is present, recommend Operations process the sump as liquid radioactive waste. If the sump must be pumped out to the Turbine Building Drain System, then process appropriate release permits per Procedure 36015-C, "Radioactive Liquid Effluent Release Permit Generation And Data Control".

NOTE

Sampling of these sumps prior to pumping is recommended, not absolutely required. They are normally non-radioactive and any activity would be detected on the WWRB composite sample.

4.6 STORM DRAINS

4.6.1 Storm drains are not routinely sampled for activity. Sampling is initiated when an event within the plant causes a release or potential release to the storm drain system.

4.6.2 The input source of activity to the storm drain system should be isolated as quickly as possible. This can be done by valve, inflatible bladder, damming, portable or temporary pumps, etc...

4.6.3 Sampling of the storm drainage system from the site boundary to its discharge point at the river should be initiated to assess extent of contamination. (See Figure 1)

NOTE

Coordinate this effort with the Health Physics Department.

4.6.4 Appropriate permits for radioactive liquid effluents should be initiated per Procedure 36015-C, "Radioactive Liquid Effluent Release Permit Generation And Data Control", if radioactivity leaves the site owner controlled area boundary.

4.6.5 Isolate or stop the flow of contaminated liquid from the site owner controlled area boundary or site property. Temporary tanks should be obtained to pump contaminated liquids into for processing as liquid radioactive waste. This is especially important if activity exceeds federal discharge Effluent Concentration limit (ECL) limits. (Refer to Procedure 36010-C, "ODCM Implementation And Control".)

4.6.6 If radioactivity is in the drainage system that drains to the south-east pond, but has not yet progressed as far as the pond, consider draining the pond to the extent possible to gain room as a buffer to collect contaminated water. Consideration should be given to hold up and processing of the storm drain and pond waters as radioactivity level warrants.

4.7 CONTROL BUILDING VENTILATION SYSTEM EXHAUST, SMOKE EXHAUST MODE

4.7.1 Upon detection of smoke in the Control Building, the ventilation system begins exhausting directly to atmosphere at the top of the Control Building. If there was simultaneously an airborne radioactivity problem this would constitute an unmonitored release point.

4.7.2 Upon initiation of the smoke exhaust mode, request Health Physics determine the concentration of airborne activity in the Control Building.

4.7.3 If airborne activity is/was present at the time of the smoke exhaust, initiate a batch release permit per Procedure 36020-C, "Radioactive Gaseous Effluent Release Permit Generation And Data Control" based on the Health Physics sample results for activity concentrations and the approximate volume discharged based on ventilation fan data and discharge times.

4.8 MISCELLANEOUS ITEMS TO ASSESS DURING PERIODS OF ACTIVITY IN NORMALLY NON RADIOACTIVE SYSTEMS

4.8.1 Include reports of events in the Annual Effluent Release Report as required by ODCM and Reg Guide 1.21.

4.8.2 Document all actions taken in chronological log format, document all requests for sampling assistance, document all sampling efforts and results obtained. Document in extreme detail any assumptions made pertaining to effluents released, along with the justification for the assumption.

4.8.3 Helpful approximate system volumes are as follows:

a. Control Building Sump - 2400 gallons

b. Condenser Hotwell and Feedwater System - 100,000 gal.

c. Turbine Building Drain Tank - 18,000 gal

5.0 REFERENCES

5.1 P&ID'S

5.1.1 1XDB142-1, Rev.12, "Control Building Drains System No. 1225".

5.1.2 1XDB146-1, Rev.13, "Auxiliary Building and Miscellaneous Drains Non-radioactive System No. 1215".

5.1.3 1XDB146-2, Rev. 15, "Auxiliary Building and Miscellaneous Drains System No, 1215".

5.1.4 1XDB146-3, Rev. 9, "Auxiliary Building and Miscellaneous Drains System No. 1215".

5.1.5 1XDB180-1, Rev 9, "Turbine Building Drain System No. 2412".

5.1.6 1XDB168-2, Rev 9, "Condensate and Feedwater System No. 1305", Sheet 2 of 3.

5.2 PROCEDURES

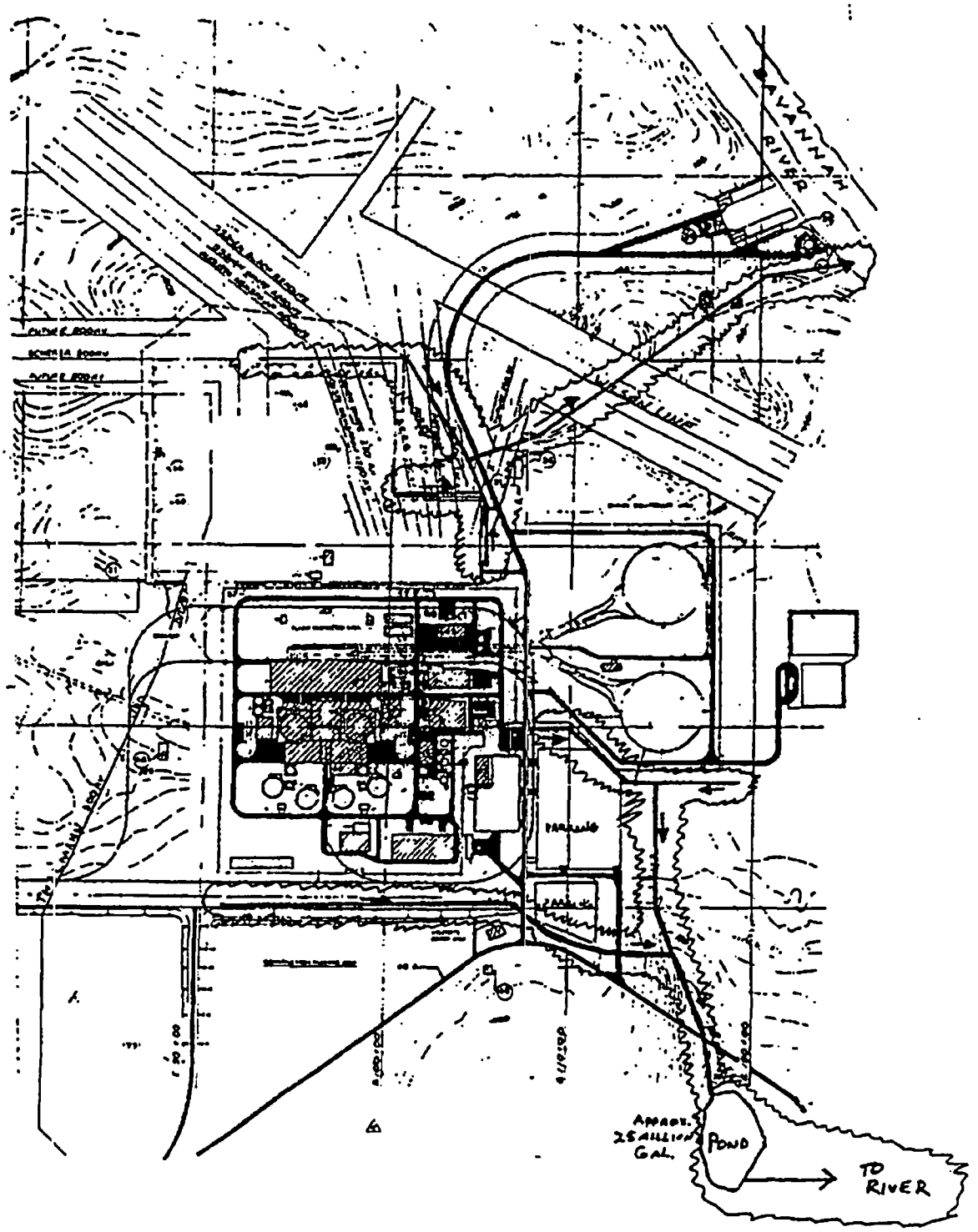
5.2.1 36010-C, "ODCM Implementation and Control"

5.2.2 36015-C, "Radioactive Liquid Effluent Release Permit Generation And Data Control Computer Method"

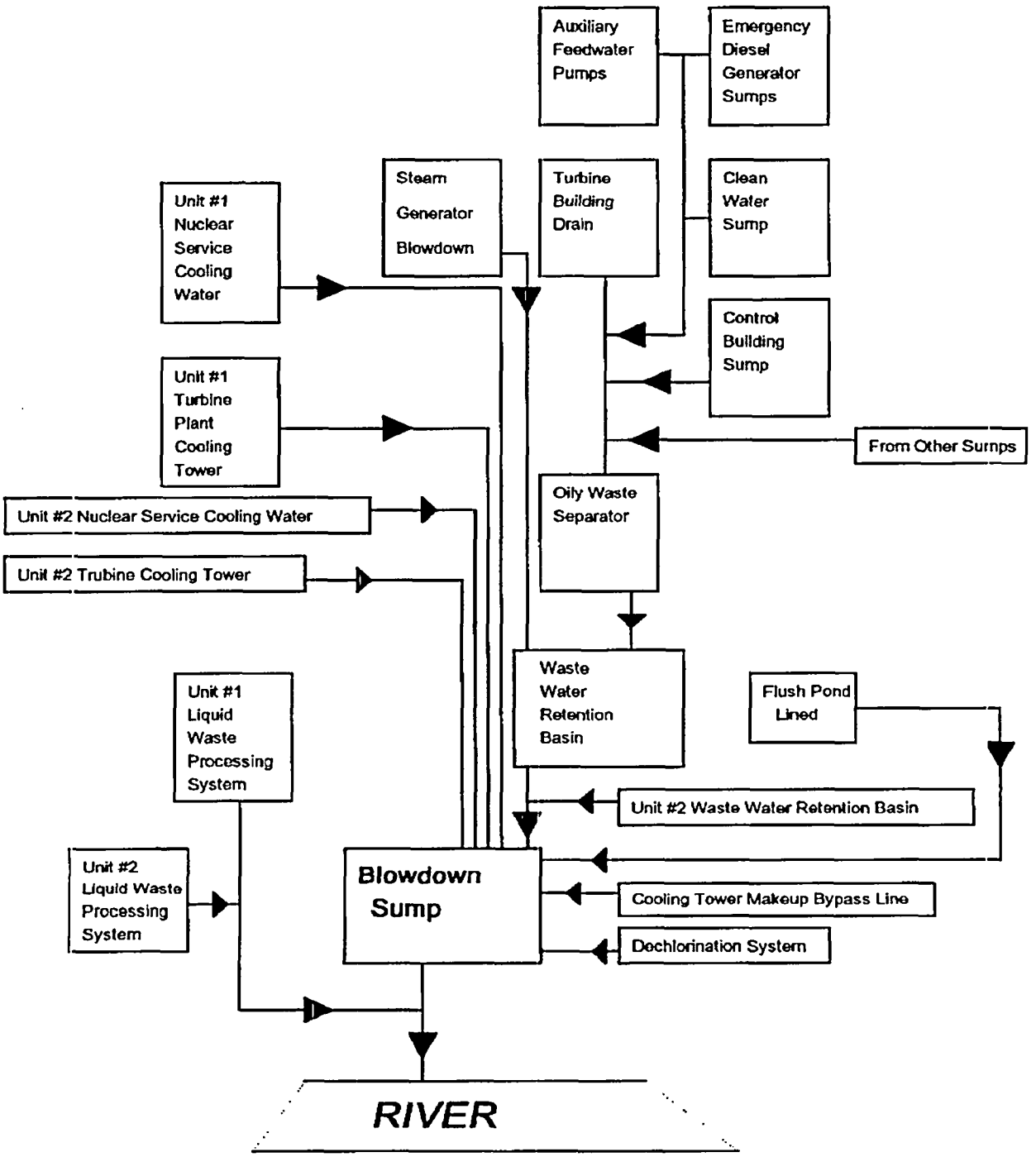
5.2.3 36020-C, "Radioactive Gaseous Effluent Release Permit Generation And Data Control Computer Method"

5.2.4 35420-C "Monitoring Of The Radioactive Liquid Waste Management System"

END OF PROCEDURE TEXT



SITE DRAINAGE
FIGURE 1



INPUTS TO BLOWDOWN SUMP
FIGURE 2