

Process Control Program

for

Ginna Station

Rochester Gas and Electric Corporation  
Revision 5, March 7, 1992

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## I. Introduction

The Radiological Effluent Technical Specifications require the establishment of a Process Control Program (PCP). The PCP herein is a manual outlining the method for processing wet solid wastes and for solidification of liquid wastes. It includes applicable process parameters and evaluation methods used at Ginna Station to assure compliance with the requirements of 10 CFR Part 71 prior to shipment of containers of radioactive waste from the site.

The Ginna PCP encompasses five types of solid wastes:

- a. Cemented Evaporator Bottoms
- b. Solidified Sludge
- c. Oily Waste
- d. Dewatered Bead Resin
- e. Filters

A radwaste sampling and analysis program has been instituted to assure compliance with 10CFR Part 61. Scaling factors have been developed to calculate concentrations of hard to measure isotopes from more easily determined isotopes. The scaling factors will enable concentrations of all required isotopes to be determined for each radwaste shipment.

All radioactive waste is shipped to a licensed burial site in accordance with applicable Nuclear Regulatory Commission, Department of Transportation, and State Regulations, including burial site regulation requirements.

To assure personnel exposure is minimized, ALARA considerations are addressed in all phases of the solidification process.

## II. Cemented Evaporator Bottoms

### A. General Description

The waste holdup tank, located in the auxiliary building, accepts liquid waste from all floor drains, certain system drains, resin sluice water, laundry and shower waste, spent fuel pit leak off and the chemical drain tank.

The liquid from the waste holdup tank is processed through cuno type filters to the waste evaporator.

The waste evaporator processes water from the waste holdup tank in a batch mode. The distillate is polished by mixed bed (HOH) demineralizer resin, collected in waste condensate and monitor tanks, sampled, analyzed and released to the discharge canal.

As an alternative, the boric acid evaporator can be used to process excess waste water which has been transferred to a CVCS holdup tank. Mixed bed (HOH) resins can also be used to polish the distillate. Sampling and release is done as for waste evaporator distillate.

The concentrates from either evaporator are processed through the waste evaporator feed tank for disposal through the drumming system as described in this section.

A third alternative available is vendor supplied demineralization systems which utilize mixed media filtration, anion (OH), cation (H) and mixed bed (HOH) resin to process water from the waste holdup system. This process can be utilized on a once through and/or recirc mode. The product water is sampled, analyzed and released to the discharge canal, the same as for the evaporator systems. Spent resins are sluiced from the vessels and shipped as described in Section V, Spent Bead Resin.

The operation of the evaporators is controlled by several operating procedures, S-3.4C, D, E, and F for the boric acid evaporator and S-4.1A, B, and C for the waste evaporator operation. The vendor demineralization systems are also controlled by plant procedures. The currently used system is controlled via S-4.1.27. The parameters used to control the batch operations are boric acid concentration and gross degassed activity. These concentrations are limited by procedure although activity may be further limited by burial ground dose rate limits.

The drumming process is currently controlled by procedure RD-16.2. The only chemical parameter which is controlled for solidification is the solution pH. A pH between 6.0 and 8.5 is required to insure that the cement will properly solidify in the least amount of time. If waste is to be drummed with the pH of the waste outside of these parameters a solidification test is performed to insure proper solidification may be achieved.

The drum filling is controlled by weight and/or level indication to control the amounts of liquid and cement to a predetermined ratio. This ratio is determined by performing a solidification test. For normal waste evaporator bottoms within the above pH requirements approximately 1 gal. of evaporator bottoms is solidified with 20 pounds of masonry cement and one pound of meta silicate as an accelerator. The minimal amount of accelerator limits the rate of the solidification process. The drums are not sealed until the solidification is verified complete and the drums are at ambient temperature. This is typically two weeks after drum filling.

The quality control section is notified prior to solidification and also prior to shipping so they may perform periodic surveillance on these processes. A minimum of 10% of all drums are visually checked for proper solidification by the QC section. If a drum is found which is not properly solidified the remaining drums in that batch are also checked. The drums are then set aside to give additional time for curing.

If the drum(s) still do not solidify, the material can be removed from the drum and mixed with more of the solidifying agent and allowed to cure.

An alternative to resolidification is to place the drum in an acceptable (to the burial site) overpack and ship to the burial site.

As a precaution, a lab test would also be performed on the next evaporator waste to insure there were no unknown matrix or chemical changes in the system which would cause the failure.

Also on one drum from approximately every tenth evaporator bottoms batch, a drum will be mechanically checked to insure that the total drum contents have properly solidified.

QC also monitors the drum loading and shipping to insure compliance with all shipping and burial regulations. After the drumming process has been completed, the drums are weighed, surveyed, serialized and stored in one of the drum storage areas. Prior to shipment the drums are cleaned, resurveyed, and labeled, in accordance with the RD-10 series procedures.

III. Solidified Sludge

A. General Description

Suspended solids and other sludges occasionally require processing. This material is processed using a vendor supplied system. A Topical Report demonstrating satisfactory processing by a vendor is required. The vendors procedures would then be PORC approved, and if necessary, a 50.59 review. Lab samples are then created and tested. Following quality control review, full scale solidification would be performed.

#### IV. Oily Waste

##### A. General Description

Oily waste is solidified by methods acceptable to licensed burial sites. An approved method is to add an emulsifier to the oily waste, then water at a neutral pH. The mixture is then solidified by adding "Envirostone" gypsum cement. The method is described in the RD-16 series of procedures.

An alternative method that may be employed would utilize filtration. As a vendor supplied system, this would require PORC review and approval.

## V. Dewatered Bead Resin

### A. General Description

Bead resin is used to remove chemical and radioactive contamination from the reactor coolant, the chemical and volume control system, the spent fuel pool, and the liquid waste processing system, and may be used to process the effluent stream described in Section IIA of the PCP.

### B. Primary Processing

When the resin is exhausted or reaches a radiation limit, it is sluiced to one of two 150 cubic foot spent resin storage tanks. After sufficient resin has been collected in one of the storage tanks, a QA order is initiated for use of a transport cask certified by the NRC for transporting greater than Type A quantities of radioactive material. Upon arrival on site, the transport cask is inspected using a Quality Control Inspection Procedure (QCIP) specific for each type of cask to ensure the cask meets all the requirements of the Certificate of Compliance and 10 CFR 71. A liner, which contains internal piping to completely dewater the resin, is installed in the cask. The cask is handled, loaded and unloaded using procedure RD-10 series specific for the model cask used. Piping is run from the drumming station to the manway in the top of the liner. Using procedures, spent resin is then slurried from the spent resin storage into the liner with water used for sparging and mixing the resin and nitrogen gas pressure used to move the resin. A representative sample of the resin is obtained and the concentration of each radioisotope is calculated. After the resin is dewatered or cemented, the liner is capped and sealed and the top is put back on the cask.

### C. Effluent Stream Processing

Liquid waste from all floor drains, regeneration wastes, certain system drains, resin sluice water, laundry and shower waste and the chemical drain tank may be processed by a vendor supplied temporary demineralizer system in lieu of the evaporator described in Section IIA of the PCP.

The demin system located in the drumming station consists of a control skid for system isolation and flow control, mechanical prefilter for roughing filtration and five 15 ft<sup>3</sup> sluicable demin vessels arranged in series.

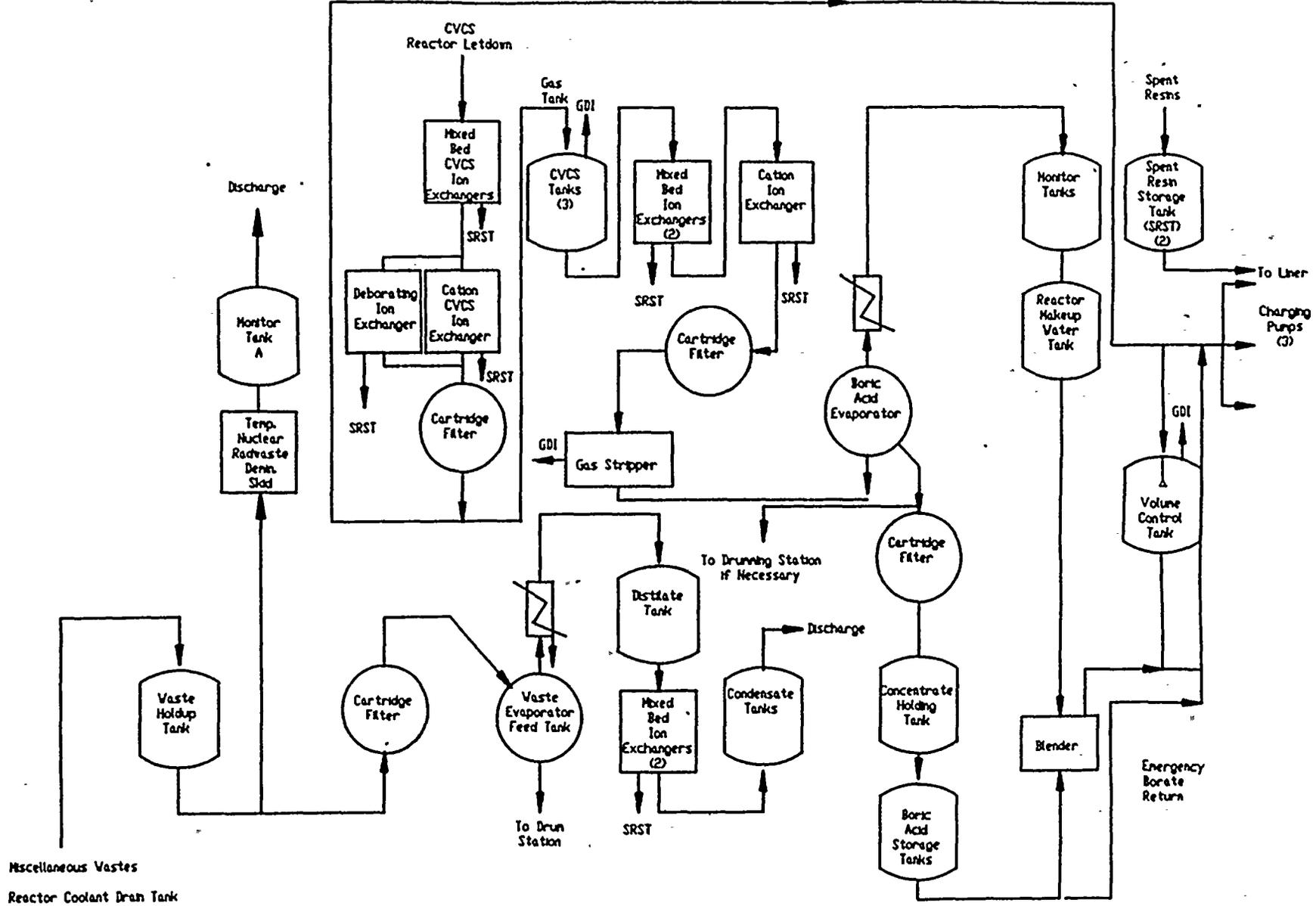
When the resin is exhausted or reaches a radiation limit, the spent resin is sluiced to a certified cask, utilizing procedures. A liner, which contains internal piping to completely dewater the resin, is installed in the cask. A representative sample of the resin is obtained and the concentration of each radioisotope is calculated.

D. Shipment Preparation:

The cask is surveyed for radiation and contamination and properly labeled and marked as specified in procedures for packaging shipment of radioactive materials. The procedures include instructions on any special requirements of the burial site to which the shipment is being sent. A radioactive shipment record is prepared and all necessary shipping papers and instructions are given to the carrier. The vehicle is placarded, the cask sealed with security seals, and the Quality Control inspection is complete. The resin is then transported to the burial site.

VI. Filters

When filters become saturated or have a high dose rate, they are dewatered and then replaced. The spent filters are placed in a High Integrity Container or solidified in an approved media and shipped in accordance with 10CFR71, 10CFR61 and burial site licenses. The maximum dose rate allowed on the surface of the container is determined by the shielding of the package in which the container is shipped. Shipping requirements for specific packages are addressed in the RD-10 series of procedures.



Miscellaneous Wastes  
 Reactor Coolant Drain Tank  
 Containment Sumps  
 Laboratory Drains  
 Equipment Drains  
 Floor Drains  
 Demineralizer Regenerants

# OPERATIONAL RADWASTE DIAGRAM

R. E. GINNA

FIGURE

RW-15  
 REV. 00  
 11/6/90

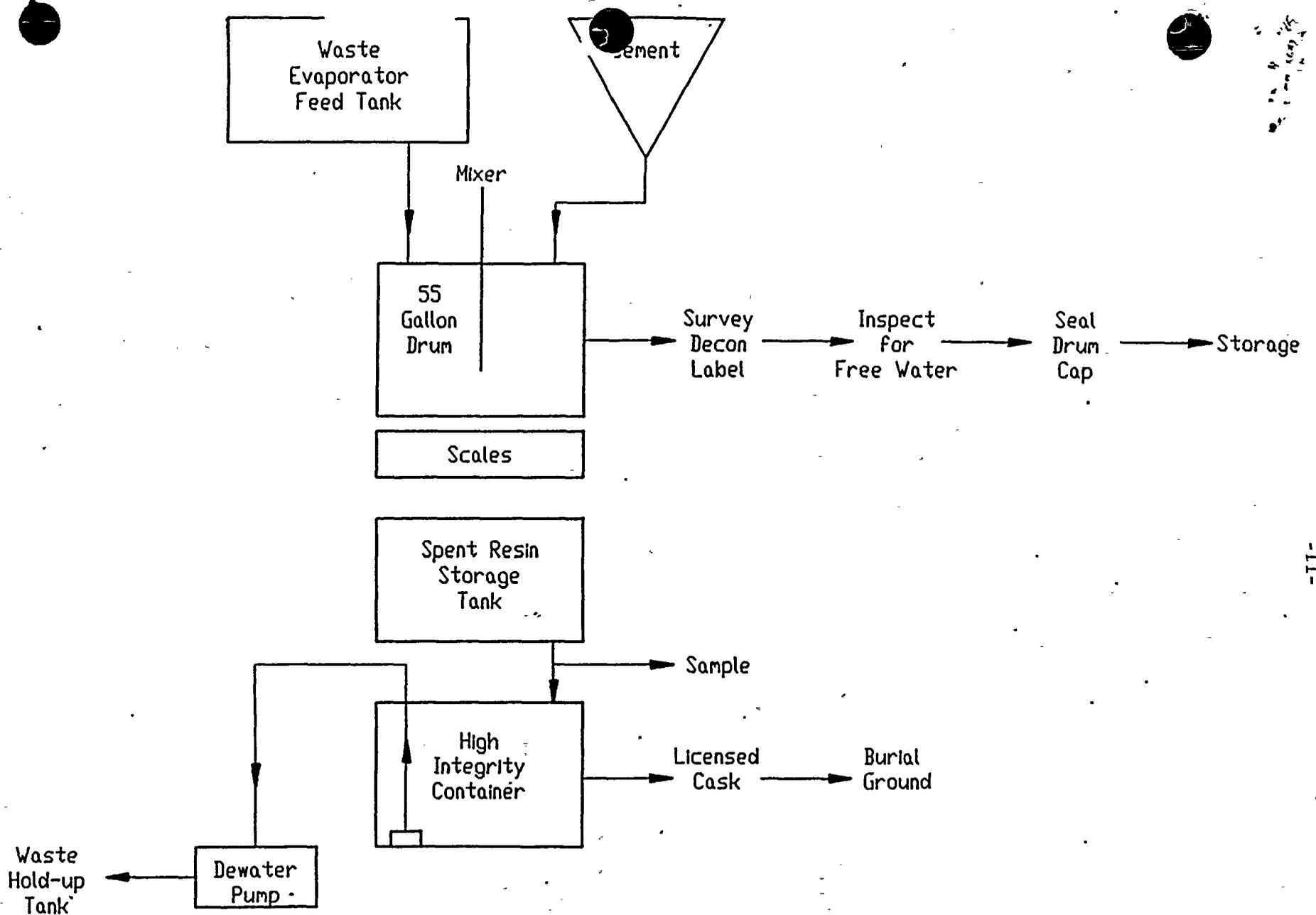


figure 2

RW-16  
 REV. 00  
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