

ENCLOSURE 5

VOGTLE ELECTRIC GENERATING PLANT
REQUEST FOR TECHNICAL SPECIFICATION CHANGES
RESPONSE TO GENERIC LETTER 6.-01
RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATION CHANGES

PROCESS CONTROL PROGRAM

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VOGTLE ELECTRIC GENERATING PLANT
PROCESS CONTROL PROGRAM
Revision 3

APPROVED: _____
General Manager - Nuclear Plant

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1.0

PURPOSE

1.1

The purpose of the Process Control Program (PCP) is to define the necessary program guidance used at Vogtle Electric Generating Plant to ensure that solid radioactive waste management activities result in the production of a waste form that meets or exceeds the requirements of 10 CFR 20, 10 CFR 50, 10 CFR 61, 10 CFR 71, Radiological Effluent Technical Specifications, as well as other Federal, State, and burial site requirements.

1.1.1

The PCP is a description of the techniques and policies associated with the disposal of solid radioactive waste. It describes the steps used by the plant staff to characterize the waste prior to stabilization, assure the quality of materials used during processing, and verify and document the integrity of the final waste form.

1.1.2

This PCP meets the requirements of Technical Specification 6.12.

2.0

SCOPE

2.1

The PCP explains the methods by which the radwaste disposal technology is monitored to assure production of a certifiable waste product. Applicable procedures, administrative controls, and quality control techniques are presented.

2.1.1

Written procedures have been established, implemented, and maintained covering the implementation of the Process Control Program. The PCP and implementing procedures are approved by Vogtle management prior to use. Changes to the PCP will be reviewed by the Plant Review Board and in accordance with the Technical Specifications.

2.1.2

The implementing procedures reference and incorporate, where appropriate, the process information found in the vendor's topical report. Vendor topical reports provide information such as:

- Binder used.
- Additive used.
- Process control parameters.
- Waste form properties.
- Description of solidification process.
- Mixing times.
- Boundary conditions.

- 3.4 Vendor Topicals
- 3.4.1 Topical Report Covering Nuclear Packaging, Inc., Dewatering System, Topical Report No. TP-02, Acceptance Date September 1985.
- 3.5 Vendor Process Control Program
- 3.5.1 Nuclear Packaging, Inc., Waste Sampling Procedure, PT-10.
- 3.5.2 Nuclear Packaging, Inc., Sieve Analysis Procedure, PT-11.
- 3.5.3 Nuclear Packaging, Inc., Procedure for Visual Operations, PT-12.
- 3.6 Vendor Operating and Maintenance Manuals
- 3.6.1 Operating Procedure Pacific Nuclear Systems, Inc./Nuclear Packaging, Inc., Resin Drying (Dewatering) System, OM-43.
- 3.6.2 Nuclear Packaging, Inc., Operation and Maintenance Manual Resin Drying System, OM-42.
- 3.7 Vogtle Operating Procedures
- 3.7.1 Spent Resin Processing Procedure for Nuclear Packaging, Inc., Dewatering System.
- 3.7.2 Chemistry Analysis Procedure
- 3.7.3 Health Physics Procedures for Solid Radwaste Processing, Waste Classification, and Shipping.
- 3.7.4 ALARA Program
- 4.0 OPERATING RESPONSIBILITIES
- 4.1 The operating organization for radwaste is in accordance with FSAR chapter 13.
- 4.2 The responsibilities for processing and disposing of radwaste are divided between the Operations and Health Physics/Chemistry Departments.
- 4.3 Processing of liquid and gaseous radwaste is performed by the Operations Department. Radwaste operators operate the equipment used for processing, such as demineralizers and filters and their associated pumps and valves.

- 4.4 Health Physics/Chemistry Waste and Decon personnel process and dispose of solid radwaste. They sort dry active waste (DAW), load disposal containers, classify, and ship the radwaste offsite for burial.
- 4.5 The Chemistry Department is responsible for analyzing the waste stream and reagent samples generated during radwaste processing. Samples are analyzed using VEGP approved procedures.
- 5.0 DEFINITIONS
- 5.1 Additive
- 5.1.1 Material which is introduced into the waste container for the purpose of promoting even, thorough solidification of the waste.
- 5.2 Batch
- 5.2.1 All waste held in a storage vessel for representative sampling prior to processing.
- 5.3 Batch Test Sample
- 5.3.1 A quantity of waste physically removed from the waste batch and subsequently solidified according to the batch test sample procedure, the test sample is subject to verification testing which, after having successfully met test requirements, certifies the entire batch.
- 5.4 Binder
- 5.4.1 The actual material which, when intimately mixed with the waste according to vendor approved formulas, physically encapsulates the waste into a free standing monolith following an acceptable cure time.
- 5.5 Cure Time
- 5.5.1 The time interval elapsing from the initial mixing of the water, binder, and additives until the onset of solidification as verified by either the exothermic heat generation or the characteristic time experienced during qualification testing of a successful batch test sample which yielded a certifiable waste form.

5.6 Free Standing Monolith

5.6.1 The resulting homogeneous mixture of waste, binder, and additives which, when combined in proper ratios according to the PCP procedures, yielded a nonflowing, self-supporting mass.

5.7 Free Standing Liquid

5.7.1 The quantity of water or liquid that can be drained from a solidification container following the accepted cure time, or in the case of dewatering, following the accepted dewatering time and process parameter acceptance criteria.

5.8 Onset of Solidification

5.8.1 The time at which the waste form is free standing and meets minimum compressive strength criteria.

5.9 Solidification

5.9.1 Solidification shall be the conversion of wet wastes into a form that meets shipping and burial ground requirements. When the specific amounts of waste, binder, and additive are mixed in accordance with vendor PCP formulas, resulting in a free standing monolith and whose process parameters are within the PCP stated boundary conditions and the batch test sample was certified.

5.10 Waste Form

5.10.1 Waste in a final packaged form acceptable for shipment to a licensed disposal facility.

5.11 Waste

5.11.1 Those low-level radioactive wastes containing source, special nuclear, or byproduct material that are acceptable for disposal in a licensed disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Waste Policy Act, that is, radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11.(2) of the Atomic Energy Act (uranium or thorium tailings or waste).

6.0 WASTE DESCRIPTION

6.1 Portable Vendor Supplied Liquid Processing Equipment

6.1.1 The liquid waste processing system (LWPS) is described in detail in Vogtle FSAR section 11.2. Potentially radioactive liquid wastes are collected in waste holdup tanks, floor drain tanks, boron recycle holdup tanks and laundry and hot shower drain tank, and chemical drain tank. These liquids are processed through portable vendor supplied liquid processing equipment located in the alternate radwaste building (ARB). This equipment consists of mechanical cartridge filters, ion exchange demineralizers, and a microfiltration system. The microfiltration system is a precoatable, backflushable filter designed to remove small, submicron (0.1 to 0.3 micron) particulate from the waste stream.

6.1.2 The portable vendor supplied liquid processing equipment can be aligned into numerous processing logics which are dependent upon the radioactivity and chemical makeup of the liquid being processed. Solid radioactive waste from the portable vendor supplied liquid processing system consists of mechanical cartridge filters and ion exchange resins. These solid wastes are processed using portable vendor supplied solid radwaste processing equipment, which is also located in the ARB.

6.2 Evaporator Concentrates

6.2.1 Reactor coolant system liquids may be recycled using the boron recycle system evaporator. Waste system liquids may be processed using the LWPS waste evaporators. Evaporator concentrates are transferred to the ARB for solidification using portable vendor supplied solid radwaste processing equipment.

6.3 Contaminated Oil

6.3.1 Contaminated oil is collected at its source, transported, and stored in leak-tight containers. Contaminated oil may be filtered and sampled for unconditional release or shipped offsite to a licensed waste processor for volume reduction and disposal.

6.4

Dry Active Waste

Dry active wastes are roughly segregated, collected, and bagged in the radiation controlled areas. The bagged waste is then transported to a staging area where bags are sorted to eliminate undesirable materials. The waste is then typically prepared for bulk shipment to an offsite licensed waste processor for volume reduction and disposal. The waste may also be processed in the dry active waste processing facility where compactible waste is compacted into 92-cubic-foot metal boxes, 55-gallon metal drums, or other suitable containers. Non-compactible wastes are packaged manually in metal boxes, 55-gallon drums, or other suitable containers. Waste processed in the dry active waste processing facility is shipped to a licensed radioactive waste disposal facility or to an offsite licensed waste processor for further volume reduction prior to disposal.

6.5

Spent Resin and Filter Crud

6.5.1

Condensate polisher resins are normally not radioactive. However, in the event of a primary-to-secondary steam generator tube leak, condensate polisher resins may be transferred to the alternate radwaste building for processing using portable vendor supplied solid radwaste processing equipment. Connections are also available in the turbine building for portable vendor supplied solid radwaste processing equipment should the processing demand became too great on the ARB.

6.5.2

Steam generator blowdown demineralizer (SGBD) resins and liquid waste processing system (LWPS) resins are transferred to the SGBD and LWPS spent resin storage tanks. The resins are transferred to the ARB for processing utilizing portable vendor supplied solid radwaste processing equipment.

6.5.3

Filter crud from the backflushable filter system is processed via portable vendor supplied liquid processing equipment located in the ARB. Provisions are also available to transfer filter crud directly to portable vendor supplied solid radwaste processing equipment located in the ARB.

6.6

Cartridge Filters

Cartridge filters are transported to the ARB for disposal in 55-gallon drums, high integrity containers, or other suitable containers.

7.0

PROCESS DESCRIPTION

Vogtle's radwaste processing system, which this PCP addresses, is composed of portable vendor supplied solid radwaste processing equipment located in the alternate radwaste building. This section contains a brief description of VEGP systems designed to handle radioactive waste. For further details, see FSAR chapter 11. Solid radioactive waste streams and their respective processing systems are also outlined in table 1.

7.1

Portable Vendor Supplied Solid Radwaste Processing Equipment

7.1.1

The portable vendor supplied solid radwaste processing equipment consists of the Nuclear Packaging Inc., dewatering system, located in the alternate radwaste building. This equipment has an approved topical report (Report No. TP-02-P) dated September 6, 1985. The equipment is operated in accordance with the procedures and the Process Control Program contained in the topical report in order to ensure that all established free standing liquid requirements are met or exceeded for shipment and disposal of dewatered ion exchange and filter media.

7.1.2

Connections for portable vendor supplied solidification equipment are also located in the ARB. Should solidification be required, vendor processes will be required to have NRC approved topical reports and will be required to be accepted for disposal by the sited state. Specific plant procedures, consistent with the vendors, shall be written and approved by the Plant Review Board to ensure that the waste processed is within the boundary conditions established in the qualification test programs that are addressed in the vendor's topical report.

7.2

High Integrity Containers

High integrity containers are used in conjunction with the Nuclear Packaging, Inc., dewatering system in order to meet the requirements of 10 CFR 20.311(d) and disposal site requirements. These containers are high density polyethylene (HDPE), high integrity containers. Assurance and documentation has been provided by the disposal site operator that structural stability consistent with 10 CFR 61 requirements will be provided at the disposal site. The State of South Carolina has authorized the Barnwell disposal site operator to receive class B & C waste in HDPE/HICS for disposal in concrete overpacks.

7.3

Licensed Waste Processor

All waste transferred to a licensed waste processor is prepared in accordance with 10 CFR 20.311 (d) and other applicable regulations. This waste consists principally of dry active waste and contaminated oil. Volume reduction techniques used by the licensed waste processor consist of compaction, incineration, decontamination, and other techniques. Following volume reduction, the licensed waste processor repackages and ships the waste to the disposal facility in accordance with 10 CFR 20.311 (f) and other applicable regulations governing the transportation and disposal of radioactive waste.

7.4

Dry Active Waste Processing And Storage Facility

Should the services of the licensed waste processor be unavailable, or at VEGP's option, dry active waste may be processed for disposal at the dry active waste processing and storage facility. Equipment is available for sorting and segregating undesirable items and for compacting waste into 55-gallon drums or 92-cubic-foot metal boxes. Disposal containers are designed to meet the requirements of 10 CFR 61 and Department of Transportation packaging regulations. Temporary storage for processing waste containers is available in the dry active waste storage facility.

8.0

ADMINISTRATIVE CONTROLS

8.1

Procurement

8.1.1

Vendors are chosen using the VEGP procurement process. The bid specification requires that vendors have approved NRC topical reports and that the process and final waste form are acceptable for disposal by the sited state. Vendor processes are required to meet the Federal, State, and burial ground regulations identified in section 3.0 of this Process Control Program. In addition to meeting the regulations, vendors are required to provide VEGP with their own NRC approved topical report, which is subject to VEGP approval and policies. Plant procedures will be approved consistent with vendor process controls, as detailed in the topical report.

8.2 Independent Audit

8.2.1 The Radwaste Department is subject to independent audits of its activities. Audits are conducted according to sections 13.4 and 17.2 of the FSAR.

8.2.2 Audits include, but are not limited to, evaluating ALARA techniques, sampling techniques, shipment forms, and procedures. Audits are done annually, as a minimum. Audit results are documented and forwarded to the appropriate department and plant managers.

8.3 Procedure Control

8.3.1 This Process Control Program and the procedures referenced herein are based on documented test data and vendor documents. These documents are controlled as described in FSAR section 13.5. A detailed listing of these procedures is contained in table 2 of this document.

9.0 WASTE CLASSIFICATION

9.1 This section addresses the analytical techniques utilized to comply with the applicable State, Federal, and burial site regulations. These techniques are subject to modification in the event of regulatory change or in the interest of worker exposure and reporting accuracy. Any changes are reflected in approved operating procedures.

9.1.1 Prior to shipping wastes to the burial site, the waste is classified according to 10 CFR 61.55. In order to classify the waste as to the type of radioactive material to be buried, selected radionuclides, their radiation level, and any other chemical species which may be present in appreciable quantities are measured.

9.2 Methods used for sampling, analyzing, and determining the radionuclides and their concentrations are consistent with the guidance set in the Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification - May 1983, Revision 0 and are contained in approved plant procedures.

9.2.1 Complete detailed analyses for all 10 CFR 61 radionuclides are performed periodically to confirm the correlation of measurements made from gross activity measurements or whenever there is reason to believe that facility or process changes may have altered previously determined correlations of gross radioactivity measurements.

10.0 SOLIDIFICATION/DEWATERING VERIFICATION

10.1 Bases - Radioactive Effluents - Solid Radioactive Wastes

This specification implements the requirements of General Design Criterion 60 of Appendix A to 10 CFR Part 50. The process parameters included in establishing the Process Control Program may include, but are not limited to, waste type, waste pH, waste/liquid/solidification agent/catalyst ratios, waste oil content, waste principal chemical constituents, and mixing and curing times.

10.2 Limiting Condition for Operation

10.2.1 Radioactive wastes shall be solidified or dewatered in accordance with the Process Control Program to meet shipping and transportation requirements during transit and disposal site requirements when received at the disposal site.

10.2.2 Applicability - At all times

10.2.3 Action

- a. With solidification or dewatering not meeting disposal site and shipping and transportation requirements, suspend shipment of the inadequately processed wastes and correct the Process Control Program, the procedures, and/or the solid waste system as necessary to prevent recurrence.
- b. With solidification or dewatering not performed in accordance with the Process Control Program, test the improperly processed waste in each container to ensure that it meets burial ground and shipping requirements and take appropriate administrative action to prevent recurrence.

10.3

SURVEILLANCE REQUIREMENTS

10.3.1

Solidification of at least one representative test specimen from at least every tenth batch of each type of wet radioactive wastes (e.g., filter sludges, spent resins, evaporator bottoms, boric acid solutions, and sodium sulfate solutions) shall be verified in accordance with the Process Control Program:

- a. If any test specimen fails to verify solidification, the solidification of the batch under test shall be suspended until such time as additional test specimens can be obtained, alternative solidification parameters can be determined in accordance with the Process Control Program, and a subsequent test verifies solidification. Solidification of the batch may then be resumed using the alternative solidification parameters determined by the Process Control Program.
- b. If the initial test specimen from a batch of waste fails to verify solidification, the Process Control Program shall provide for the collection and testing of representative test specimens from each consecutive batch of the same type of wet waste until at least three consecutive initial test specimens demonstrate solidification. The Process Control Program shall be modified as required, as provided in Technical Specifications section 6.12, to assure solidification of subsequent batches of waste.
- c. With the installed equipment incapable of meeting section 10.2 or declared inoperable, restore the equipment to operable status or provide for contract capability to process wastes as necessary to satisfy all applicable transportation and disposal requirements.

11.0

RECORDS

11.1

Materials Receipt Records

11.1.1

Materials are inspected upon receipt, sampled as necessary, and logged. The receipt date, condition of material, shelf life, quantities, and other pertinent information are recorded.

11.2 Processing, Shipping, Disposal, and Waste Classification Records

11.2.1 Records regarding the processing, classification, shipping, and disposal of radioactive waste are developed, completed, reviewed, and maintained in accordance with Technical Specifications section 6.9, FSAR subsection 17.2.6, and approved plant procedures.

12.0 REPORTS

12.1 Semiannual Radioactive Effluent Release Report

The Semiannual Radioactive Effluent Release Report, submitted in accordance with Technical Specifications 6.8.1.4, shall include a summary of the quantities of solid radwaste released from the units, as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," Revision 1, June 1974, with data summarized on a 6-month basis following the format of Appendix B thereof. For each type of solid radwaste shipped offsite during the report period, the report shall include the following information:

- a. Container volume.
- b. Total curie quantity (specify whether determined by measurement or estimate).
- c. Principal radionuclides (specify whether determined by measurement or estimate).
- d. Type of waste (e.g., spent resin, compacted dry waste, evaporator bottoms).
- e. Type of container (e.g., LSA, type A, type B, large quantity).
- f. Solidification agent (e.g., cement, urea formaldehyde).

Licensee initiated major changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Semiannual Radioactive Effluent Release Report for the period in which the change was implemented. The discussion of each change shall include the following:

- a. A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR 50.59.
- b. Sufficient detailed information to support totally the reason for the change without benefit of additional or supplemental information.
- c. A detailed description of the equipment, components, and processes involved and the interfaces with other plant systems.
- d. An evaluation of the change that shows the predicted quantity of solid waste that differs from those previously predicted in the license application and amendments thereto.
- e. An evaluation of the change that shows the expected maximum exposures to individuals in the UNRESTRICTED AREA and to the general population that differ from those previously estimated in the license application and amendments thereto.
- f. A comparison of the predicted releases of radioactive materials in solid waste to the actual releases for the period prior to when the changes are to be made.
- g. An estimate of the exposure to plant operating personnel as a result of the change.
- h. Documentation of the fact that the change was reviewed and found acceptable by the PRB.

TABLE 1

VOGTLE ELECTRIC GENERATING PLANT
RADIOACTIVE WASTE STREAMS

| WASTE STREAM | SOURCE | PROCESSING SYSTEM |
|------------------------------------|--|--|
| SPENT RESINS | | |
| Mixed bed bead | CVCS mixed bed demineralizer Recycle evaporator feed demineralizers Recycle evaporator condensate demineralizers Steam generator blowdown mixed bed demineralizers Waste evaporator condensate demineralizer Waste monitor tank demineralizer Spent fuel pool demineralizer Turbine building drain system demineralizer | Vendor dewatering |
| Cation Bead Resin (Borated) | CVCS cation bed demineralizer | Vendor dewatering |
| Anion Bead Resin (Borated) | Boron thermal regeneration demineralizer | Vendor dewatering |
| Powdex Resin | Condensate polishers demineralizers | Vendor dewatering |
| Ecodex Resin | Vendor supplied micro-filtration unit | Vendor dewatering |
| Mixed Bed/Cation, Anion Bead Resin | Vendor supplied liquid waste processing system | Vendor dewatering |
| EVAPORATOR CONCENTRATES | | |
| Boric Acid (6-12 wt percent) | Waste evaporator boron recycle evaporator | Vendor solidification |
| CONTAMINATED OIL | | |
| Oil (various weights and grades) | Maintenance, oil spills, etc. | Filtration or licensed waste processor |

TABLE 1 (CONTINUED)

DRY ACTIVE WASTE

| | | |
|----------------|------------------------------|--|
| Compactible | Paper, rags, trash, etc. | Compactor, or licensed waste processor |
| Noncompactible | Piping, valves, tubing, etc. | Packaged in DOT package, or licensed waste processor |

FILTER CRUD

| | | |
|---------------------|-----------------------------|--|
| Filter Particulates | Vasco backflushable filters | Vendor supplied liquid waste processing equipment, vendor solidification |
|---------------------|-----------------------------|--|

CARTRIDGE FILTERS

| | | |
|------------------------------|---|--------------------------|
| Mechanical Cartridge Filters | Vendor supplied liquid waste processing system, spent fuel pool purification, reactor cavity filtration, etc. | High integrity container |
|------------------------------|---|--------------------------|

TABLE 2

VOGTLE ELECTRIC GENERATING PLANT
 PROCEDURES GOVERNING THE
 PROCESSING, CLASSIFICATION, SHIPPING,
 AND DISPOSAL OF RADIOACTIVE WASTE

| | |
|---------|--|
| 46023-C | Dry Active Waste Sorting, Segregation, Monitoring and Processing |
| 46100-C | 10 CFR 61 Waste Classification Program |
| 46101-C | Dry Waste Processing |
| 46102-C | Operation of Support Systems in the Dry Active Waste Processing and Storage Facilities |
| 46104-C | Shipment of Radwaste to a Licensed Waste Processor |
| 46105-C | Radwaste Disposal and Notification Requirements |
| 46106-C | Waste Classification Resin Shipment |
| 46107-C | Waste Classification DAW Shipments |
| 46108-C | Waste Classification Filter Shipments |
| 46109-C | Waste Classification Miscellaneous Waste Shipments |
| 46110-C | Shipment of Radioactive Waste |
| 46111-C | Contaminated Oil Processing |
| 46112-C | Spent Filter Processing |
| 13275-C | Mobile Solidification |
| 13285-C | Spent Resin Processing |
| 31000-C | Chemistry Quality Assurance and Control Program |
| 33035-C | Gamma Spectroscopy for Radiochemistry |
| 36025-C | Semi Annual Effluent Release Report Preparation |
| 00100-C | Quality Assurance Records Administrative |

TABLE 2 (CONTINUED)

| | |
|---------|--|
| 00161-C | Permits and Licenses |
| 00256-C | Radioactive Waste Minimization Program |