

DUKE POWER COMPANY

PROCESS CONTROL PROGRAM

INTRODUCTION AND BACKGROUND

Final Safety Analysis Report Chapter 16, Selected Licensee Commitments, Section 11 requires that the Solid Radwaste System be operated in accordance with a "Process Control Program" for solidification and dewatering such that the final product meets all applicable shipping, transportation and disposal site requirements.

These "Process Control Program" requirements are applicable to liquid or wet solid wastes only. Process Control Program review, audit, procedure, reporting, and record retention requirements are specified in Section 6.0 of Technical Specifications.

While the Selected Licensee Commitments require a "Process Control Program", they do not provide sufficient guidance on the totality of the requirements that must be addressed in an acceptable program. These requirements can be found in several documents developed by the NRC to provide guidance on a "Process Control Program". These documents include:

1. NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants"
2. NUREG-0452, "Standard Technical Specifications for Westinghouse PWR's"
3. NUREG-0800, "Standard Review Plan for Solid Waste Management Systems"
4. Branch Technical Position - ETSB 11-3, "Design Guidance of Solid Radioactive Management Systems"
5. Appendix 11.4-A, "Design Guidance for Temporary Onsite Storage of Low Level Radioactive Waste"
6. NRC Review Criteria for Solid Waste Management Systems
7. Site-specific Technical Specifications and Selected Licensee Commitments.

These documents, except for site Technical Specifications and Selected Licensee Commitments, can be found in Section VI of this manual.

A listing of the requirements specified or referenced by each document can be found in Section VII. These requirements can be generally summarized as follows:

Rev. 1

1. A PCP shall be used to control all solidification and dewatering activities.
2. A PCP shall assure compliance with applicable federal regulations: 10CFR Parts 20, 50, 61, and 71 and 49 CFR (173-179).
3. A PCP shall be approved by the NRC prior to implementation.
4. Changes to the PCP shall be submitted to the NRC in the Semiannual Radioactive Effluent Report.
5. A PCP shall consist of the processing steps and processing parameters that must be followed to assure satisfactory solidification and/or dewatering products.
6. A PCP shall establish a sampling or testing schedule for verification of solidification.
7. A PCP shall establish a set of records that must be maintained for each solidification and dewatering performed for disposal.
8. A PCP shall specifically address methods for radioactive waste oil disposal.
9. A PCP shall address chemical compatibility of waste and disposal container during interim storage.
10. A PCP shall be implemented in station operating procedures.
11. A PCP shall establish a system of technical and management review and approval for all changes to itself or its implementing procedures.
12. A PCP shall establish a system of performance audits for itself and its implementing procedures.

This manual outlines Duke Power Company's program for complying with the NRC requirements for a Process Control Program for the Oconee, McGuire and Catawba Nuclear Stations. The Corporate Process Control Program is the list of the specific requirements that must be met to assure a final solidification or dewatering product meets all federal and state regulations. The Station Process Control Program is a list of the operating procedures that implement the requirements of the Corporate PCP and a station specific drawing reference for system interfaces.

As the Nuclear Regulatory Commission further defines their requirements for a PCP and as federal or state regulations change, this manual will be revised to meet these changes.

SOLIDIFICATION

General System Description

Solidification is accomplished at all Duke Power Nuclear Stations by mixing measured amounts of waste, binder, and required additives and allowing sufficient cure time to insure a solid free-standing monolith.

A measured amount of waste is transferred from company-owned and controlled containers (e.g., waste storage tanks, tankers, drums) through company- or vendor-supplied isolation valves to the solidification vessel.

Measured amounts of binding agent and additives (as required) are transferred from storage containers through transfer lines to the solidification vessel.

The waste and binder are mixed using company- or vendor-supplied equipment and allowed to cure for a predetermined time. At the end of the curing period, the absence of free liquids is verified either by confirmation that the PCP was followed or by physical testing.

The solidification system ventilation discharge is routed through company- or vendor-supplied piping to the plant's Auxiliary Building or Radwaste Facility ventilation system prior to discharge to the environment. If the solidification system has filtered ventilation, exhaust need not be routed back to building ventilation.

Any decanted liquids (e.g., excess sluice liquid) are routed back to plant storage tanks through company-or vendor-supplied piping.

Solidification equipment and processing may be provided by vendor, by permanent Duke Power systems, or by portable Duke Power systems. Any process used shall be verified by station and corporate Radwaste staffs as meeting all requirements outlined in the Corporate PCP. Verification and approval by station and corporate Radwaste supervision are required prior to placing any system in service for the purpose of producing solidified waste for disposal as radioactive waste.

DEWATERING

General System Description

Dewatering is accomplished by removing all free liquids from "wet solids" such that the final product meets all regulatory and burial

site criteria for disposal (i.e., less than 0.5% free standing liquid by waste volume per container or less than 1% free standing liquid if a high integrity container is utilized).

All wastes to be dewatered are degassed prior to the dewatering process. Therefore special ventilation requirements are not necessary.

Liner Dewatering:

Vendor- or company-supplied liners are used to dewater large volumes of wet solids, usually resin slurries. The wet solids are transferred from company owned and controlled storage containers (e.g., tanks, temporary liners) through company- or vendor-supplied isolation valves to the disposal liner. All free liquid is pumped out of the liner and returned to the company storage containers using company or vendor pumps and piping.

Demineralizer Dewatering:

Vendor-supplied portable demineralizers are dewatered by using company or vendor pumps to remove all free liquids from the vessel. The dewatering liquid is returned to company storage containers for sampling prior to reuse or processing.

Filter Dewatering:

Filters are dewatered by draining and drip drying or blowing down prior to shipment. Packing material may be placed within the vessel to maintain position of contents during shipment.

Filter Slurry Dewatering:

Filter backwash slurry may be dewatered similar to resin liner dewatering or solidified.

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