DUKE POWER COMPANY

CATAWBA NUCLEAR STATION

PROCESS CONTROL PROGRAM

1.0 PURPOSE

The purpose of the Catawba Nuclear Station Process Control Program is to insure all requirements of the DPC Corporate Process Control Program have been met for each container of solidified or dewatered radioactive waste shipped for burial at a licensed burial facility. This PCP is applicable only to the solidification or dewatering of liquid or wet solid radioactive waste.

2.0 COMPOSITION

2.1 The Catawba Nuclear Station Process Control Program shall consist of:

2.1.1 A list of all station-specific procedures that implement the requirements of the Corporate Process Control Program.

2.1.2 Catawba Nuclear Station diagrams or drawings or drawing numbers showing all connections between CNS radwaste systems and solidifications and dewatering equipment.

2.1.3 Documentation of NRC approval of the initial Catawba Nuclear Station Process Control Program.

2.1.4 Documentation of System Radwaste Engineer and CNS Technical Services Superintendent approval of all changes to the Corporate Process Control Program.

2.1.5 Documentation that all changes to the Corporate and/or CNS Process Control Program were sent to the NRC in the Semi-Annual Radioactive Effluent Report.

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SECTION 2.1.1

Implementing Procedure

HP/O/B/1006/09	"Shipment of Radioactive Filters and Filter Media"
HP/O/B/1006/10	"Shipment of Solidified Radwaste"
HP/O/B/1006/12	"Shipment of Dewatered Resins"
HP/O/B/1006/13	"Determination of the Waste Classification for Radioactive Waste Offered for Shallow Land Burial"
OP/O/B/6500/13	"Operating Procedure for the Nuclear Solid Waste (WS) Disposal System"
OP/O/B/6500/46	"Radwaste Operating Procedure for Solidification and Dewatering of Radioactive Waste"
OP/O/B/6500/49	"Radwaste Chemistry Operating Procedure for Sampling the ECHT, ECBT, and RBT Using In-line Samples"

SECTION 2.1.2

Drawing Index

Plant Interfaces: CN-1566-1.6

DUKE POWER COMPANY

CORPORATE

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DUKE POWER COMPANY

CORPORATE

PROCESS CONTROL PROGRAM

1.0 PURPOSE

1.1 The purpose of the Duke Power Company Corporate Process Control Program is to establish a set of requirements that shall be met at all nuclear stations to insure that all solidification and dewatering activities are conducted in a manner and produce a final product that complies with all applicable Federal and State regulations and licensed burial site criteria.

1.2 The Duke Power Company Process Control Program shall be used to control and direct all solidification and dewatering activities for liquids (e.g., evaporator concentrates) and "wet solids" (e.g., resin slurries, filter backwash slurries, cartridge filters) at the Oconee Nuclear Station, Units 1, 2 and 3, the McGuire Nuclear Station, Units 1 and 2, and the Catawba Nuclear Station, Units 1 and 2.

1.3 Station - specific procedures shall be developed to implement the requirements of this corporate PCP.

1.4 This Process Control Program and implementing procedures shall assure that all solidification and dewatering activities are in compliance with 10CFR20, 50, 61, 71, 49 CFR and licensed burial site criteria.

1.5 If this Process Control Program is not followed, each vessel of processed (i.e., solidified or dewatered) waste shall be physically tested to verify the absence of free standing liquids.

2.0 SOLIDIFICATION

2.1 Vendor Requirements

2.1.1 Any vendor solidification services utilized by Duke Power Company shall have a NRC approved Topical Report.

2.1.2 Any vendor solidification services utilized by Duke Power Company shall be approved by the Corporate Radwaste Engineer and station(s) Technical Services Superintendent prior to operation.

2.1.2.1 Technical review shall be performed by corporate and station radwaste staffs of all vendor documents and procedures to insure they meet the requirements of the Duke Power Company PCP outlined below.

2.1.3 Chem-Nuclear Systems Inc. has been reviewed and approved to provide solidification services to the Oconee, McGuire, and Catawba Nuclear Stations as described in: Mobile Cement Solidification System, Topical Report CNSI-2(4313-01354-0IP-A). Approved waste forms for

solidification are:boric acid evaporator concentrates, spent bead resin, spend powdered resin, filters, filter backwash slurry, and resin regenerative chemical wastes.

2.2 Program Requirements

2.2.1 The vendor topical report shall include a detailed system description giving all vendor interfaces with company equipment. Drawings or diagrams shall be included detailing all solidification system interfaces with plant radwaste systems and equipment.

2.2.2 The vendor topical report shall include a statement that the design, construction, operation and quality assurance provisions are in accordance with NRC ETSB Branch Technical Position 11-3 and Regulatory Guide 1.143.

2.2.3 Duke Power Company permanent or portable solidification systems shall have a detailed system description giving all solidification equipment interfaces with other company equipment. Drawings or diagrams shall be included detailing all solidification system interfaces with other plant radwaste equipment and systems.

NOTE: This information may be included as part of a Topical Report furnished by the equipment manufacturer or supplier or as part of the plant specific Final Safety Analysis Report.

2.2.4 Duke Power Company permanent or portable solidification systems shall be designed, constructed, operated per and meet all quality assurance provisions of NRC ETSB Branch Technical Position 11-3 and Regulatory Guide 1.143.

2.2.5 Station procedures shall be established to assure the following requirements are met:

2.2.5.1 A representative sample shall be taken from at least every tenth batch of each waste type to verify solidification.

2.2.5.2 If the initial sample fails to verify solidification, a representative sample shall be taken from each consecutive batch of the same type waste until three consecutive samples demonstrate solidification.

2.2.5.3 A representative sample shall meet all the following conditions:

2.2.5.3.1 The contents of the container to be sampled shall be recirculated a minimum of three volume turnovers or adequately mixed to achieve a homogeneous mixture.

NOTE: Adequately mixed shall be defined as: mixing via agitative or recirculative flow which exceeds a specified minimum rate which has been documented to provide a representative sample for the vessel.

2.2.5.3.2 For final samples prior to initiating solidification, no additional waste shall be introduced into the container after recirculation or mixing has begun. Vessel level readings or input isolation shall be documented at the time of mixing initiation, and process initiation.

2.2.5.3.3 Recirculation or mixing time and/or volume must be uninterrupted from initiation until completion of sample collection.

2.2.5.4 During the recirculation and sampling period, the vessel shall not be placed in a transfer mode.

2.2.5.5 Sample analysis shall be performed as outlined in site-specific procedures for each waste form and solidification media. These should include such analysis as:

2.2.5.5.1 Waste pH

2.2.5.5.2 Waste density

2.2.5.5.3 Waste boron concentration

2.2.5.5.4 Waste oil content

2.2.5.6 Test solidification shall be performed to establish boundary conditions for all process parameters.

NOTE: "Process parameters" shall be defined as, "those conditions critical to insure complete solidification".

NOTE: "Boundary conditions" shall be defined as, "acceptable numerical values for process parameters as established by a test solidification".

2.2.5.7 Process parameters should include any of the following which are required to assure solidification:

2.2.5.7.1 Waste form.

2.2.5.7.2 Waste to solidification agent ratio.

2.2.5.7.3 Amount of each solidification additive.

2.2.5.7.4 Waste pH.

2.2.5.7.5 Waste boron concentration.

2.2.5.7.6 Waste density.

2.2.5.7.7 Waste oil content.

2.2.5.7.8 Mixer speed.

2.2.5.7.9 Mixing time.

2.2.5.7.10 Curing time.

2.2.5.7.11 Specific activity.

2.2.5.8 Vendor shall submit sample analysis, test solidification results and prescribed boundary conditions to Station Radwaste Supervision.

2.2.5.9 Station Radwaste Supervision shall review the data outlined in Step 2.2.5.8 and shall authorize solidification prior to initiation.

2.2.5.9.1 Difficulties and/or disagreements between vendor and station personnel should be resolved through direct interaction between vendor and station. Corporate Radwaste Engineering staff should be contacted if resolution can not be reached at the station level.

2.2.5.10 Solidification for disposal shall not be performed unless the test solidification is acceptable.

2.2.5.11 All system operation shall be controlled by station procedures to assure that the solidification system is operated within the boundary conditions established in Step 2.2.5.7.

2.2.5.11.1 Vendor procedures shall be incorporated as attachments to station procedures. Vendor format may be retained as a DPC enclosure if desired or the procedure may be rewritten into DPC format.

2.2.5.12 The absence of free liquids shall be verified for each vessel of solidified waste prior to disposal. Verification shall be performed by either confirmation that the Process Control Program was followed or by physical testing.

2.2.5.12.1 Physical testing shall be required for each vessel if the Process Control Program was not followed or if any off-normal condition existed during processing.

2.2.5 12.1.1 Physical testing shall consist of visual inspection and probe penetrate tests.

2.2.5.12.2 A vessel shall have less than 0.5% free standing liquid by waste volume.

2.2.5.12.3 If a High Integrity Container is utilized, the vessel shall have less than 1% free standing liquid.

2.2.5.13 Any solidification vessel that does not pass the tests specified in Step 2.2.5.12 shall not be shipped to a burial

site until reprocessing or repackaging has resulted in an acceptable product.

2.2.5.14 Records shall be maintained by Duke Power Company on each vessel of solidified wastes. These records shall be maintained for six (6) years (per the Administrative Policy Manual).

2.2.5.14.1 These records shall include:

2.2.5.14.1.1 Representative sampling documentation (per Step 2.2.5.3).

2.2.5.14.1.2 Sample analysis results (per Step 2.2.5.5).

2.2.5.14.1.3 Reference test solidification results and boundary conditions (per Steps 2.2.5.6 and 2.2.5.7)

2.2.5.14.1.4 Station Radwaste Supervision authorization for solidification per (Step 2.2.5.9).

2.2.5.14.1.5 System operation data to insure all boundary conditions were met (per Step 2.2.5.11).

2.2.5.14.1.6 FSL Verification (per Step 2.2.5.12).

3.0 DEWATERING

3.1 Vendor Requirements

3.1.1 Any vendor utilized by Duke Power Company to provide dewatering services shall have a NRC approved Topical Report.

3.1.2 Any vendor dewatering services utilized by Duke Power Company shall be approved by the Corporate Radwaste Engineer and station(s) Technical Services Superintendent prior to operation.

3.1.2.1 Technical review shall be performed by corporate and station radwaste staffs of all vendor documents and procedures to insure they meet all requirements of the Duke Power Company PCP outlined below.

3.1.3 Chem-Nuclear Systems Inc. has been reviewed and approved to provide dewatering services to Oconee, McGuire, and Catawba Nuclear Stations as described in Topical Report CNSI-DW-11118-01.

3.2 Program Requirements

3.2.1 The vendor topical report shall include a detailed system description giving all vendor interfaces with company equipment. Drawings

or diagrams shall be included detailing all dewatering system interfaces with plant radwaste systems and equipment.

3.2.2 The vendor topical report shall include a statement that the design, construction, operation and quality assurance provisions are in accordance with Regulatory Guide 1.143.

3.2.3 All vendor supplied portable demineralizers shall be covered by a topical report that meets all requirements of Steps 3.2.1 and 3.2.2.

3.2.4 Duke Power Company permanent or portable dewatering systems shall have a detailed system description giving all dewatering equipment interfaces with other company equipment. Drawings or diagrams shall be included detailing all dewatering system interfaces with other plant radwaste equipment and systems.

NOTE: This information may be included as part of a Topical Report furnished by the equipment manufacturer or supplier or as part of the plant specific Final Safety Analysis Report.

3.2.5 Duke Power Company permanent or portable dewatering systems shall be designed, constructed, operated per and meet all quality assurance provisions of NRC Branch Technical Position 11-3 and Regulatory Guide 1.143.

3.2.6 Station procedures shall be established to assure the following requirements are met:

3.2.6.1 Boundary conditions shall be established for all process parameters.

NOTE: Process parameters shall be defined as, "those conditions critical to insure complete dewatering".

NOTE: "Boundary conditions" shall be defined as, "acceptable numerical values for process parameters".

3.2.6.2 Process parameters shall be identified in site-specific procedurs. Typical parameters are:

3.2.6.2.1 Waste form.

3.2.6.2.2 Settling time.

3.2.6.2.3 Drain (or pump) time

3.2.6.2.4 Drying time.

3.2.6.3 Sample analysis and boundary conditions shall be submitted to the Station Radwaste Supervisor.

3.2.6.3.1 For filter dewatering, data shall be submitted to the Station Health Physics Supervisor.

3.2.6.4 Station Supervisor shall review the data outlined in Step 3.2.6.3 and shall authorize dewatering prior to initiation.

3.2.6.4.1 Difficulties and/or disagreements between vendor and station personnel should be resolved through direct interaction between vendor and station. Corporate Radwaste Engineering staff should be contacted if resolution can not be reached at the station level.

3.2.6.5 All operations shall be controlled by station procedures to assure that all boundary conditions established in Step 3.2.6.1 are met.

3.2.6.5.1 Vendor procedures shall be incorporated as attachments to station procedures. Vendor format may be retained as a DPC enclosure if desired or the procedure may be rewritten into DPC format.

3.2.6.6 The absence of free liquids shall be verified for each vessel of dewatered waste prior to disposal. Verification shall be performed by either confirmation that the Process Control Program was followed or by physical testing.

3.2.6.6.1 Physical testing shall be required for each vessel if the Process Control Program was not followed or if any off-normal condition existed during processing.

3.2.6.6.2 A vessel shall have less than 0.5% free liquids by waste volume.

3.2.6.6.3 A high integrity container shall have less than 1% free liquids by waste volume.

3.2.6.7 Any dewatered vessel containing excess free liquids, as defined in Step 3.2.6.6, shall not be shipped to a burial site until reprocessing or repackaging has resulted in an acceptable product.

3.2.6.8 Records shall be maintained by Duke Power Company on each vessel of dewatered wastes. These records shall be maintained for six (6) years (per the Administrative Policy Manual). These records shall include:

3.2.6.8.1. Sample analysis and boundary conditions (per Step 3.2.6.3).

3.2.6.8.2 Station supervisor authorization for dewatering (per Step 3.2.6.4).

3.2.6.8.3 Equipment operation data to insure all boundary conditions were met (per Step 3.2.6.5).

3.2.6.8.4 FSL Verification (per Step 3.2.6.6).

4.0 WASTE OIL

4.1 Incidental levels of waste oil may be solidified using the system described in Section 2.2.

4.1.1 "Incidental" shall be defined as less than 1% oil.

4.2 If larger volumes of waste oil are to be solidified a special procedure shall be used.

4.2.1 The oil-specific procedure shall include all requirements in Section 2.0.

4.3 Solidified waste oil shall not be shipped to the licensed burial site at Barnwell, S.C. for disposal, except as defined in Step 4.1.

5.0 INTERIM STORAGE

5.1 Program Requirements

5.1.1 Station procedures shall be established to assure the following requirements are met:

5.1.1.1 Any processed (i.e., solidified or dewatered) waste that is stored for an interim period in a disposal container shall be packaged such that there is no interaction between the waste and its container.

5.1.1.2 If applicable, Certificates of Compliance shall be maintained at each station for all waste disposal containers used for interim storage.

5.1.1.3 Vendor supplied handling and storage procedures shall be maintained at each station.

5.1.1.4 Each container and waste shall be checked against information given in Steps 5.1.1.2 and 5.1.1.3 to insure all chemical compatibility requirements are met.

5.1.1.5 Station Radwaste or Health Physics supervision shall review the information in Step 5.1.1.4 and shall certify chemical compatibility and authorize storage.

5.1.1.6 Records shall be maintained by Duke Power Company for each container. These records shall be maintained for six (6) years (per the Administrative Policy Manual). These records shall include:

5.1.1.6.1 Chemical compatibility certification (per Step 5.1.1.5).

5.1.1.6.2 Station supervision authorization to store waste (per Step 5.1.1.5).

6.0 10 CFR 61 COMPLIANCE

6.1 Vendor Requirements

6.1.1 The vendor(s) described in Section 2.1 for solidification shall have a NRC approved report documenting compliance with waste form requirements in the final solidified product.

6.1.2 The vendor(s) described in Section 3.1 for dewatering shall have a NRC approved report documenting compliance with waste form requirements in the final dewatered product.

6.1.3 Any vendor providing High Integrity Containers to Duke Power Company shall have a NRC approved report documenting compliance with waste form requirements.

6.1.4 All vendor reports (per Steps 6.1.1, 6.1.2, and 6.1.3) shall contain a statement that the final product conforms to the appropriate waste form for either Class A, B or C waste.

6.2 Program Requirements

6.2.1 Station procedures shall be established to assure the following requirements are met:

6.2.1.1 Each container of processed (i.e., solidified or dewatered) waste shall be classified as either Class A, B or C waste using the Duke Power Company "10 CFR Part 61 Waste Classification and Waste Form Implementation Program".

6.2.1.2 Each container of processed waste shall be certified to the appropriate waste form for either Class A, B or C waste.

6.2.1.2.1 Waste form certification shall be contingent upon the documents referenced in Section 6.1.

6.2.1.3 Records shall be maintained for each container of processed waste to assure compliance with the requirements of Steps 6.2.1.1 and 6.2.1.2. These records shall be maintained for six (6) years (per the Administrative Policy Manual).

7.0 TRANSPORTATION

7.1 Program Requirements

7.1.1 All shipping casks used to transport processed waste for burial shall have a NRC issued Certificate of Compliance.

7.1.2 Station procedures shall be established to insure all requirements of the Certificate of Compliance are met.

7.1.2.1 Vendor procedures shall be incorporated into station procedures prior to use. Vendor format may be retained if desired or the procedure may be rewritten into DPC format.

7.1.3 Station procedures shall be established to insure all applicable Federal and State regulations and burial site criteria are met for each container of processed waste.

7.1.4 Records shall be maintained for each container and shipment of processed waste. These records shall be maintained for six (6) years or life of station per the Administrative Policy Manual). These records shall include:

7.1.4.1 Documentation of a valid Certificate of Compliance for each cask (per Step 7.1.1). Maintained for six (6) years.

7.1.4.2 Documentation that all requirements of the Certificate of Compliance were met (per Step 7.1.2). Maintained for six (6) years.

7.1.4.3 Documentation that all shipping regulations were met (per Step 7.1.3). Maintained for life of plant.

8.0 REVIEWS

8.1 Program Requirements

8.1.1 Changes to the Corporate Process Control Program shall be reviewed by the Corporate Radwaste Engineering staff and each station's Radwaste and Health Physics staffs prior to implementation. Proposed revisions shall be reviewed against Technical Specifications and all applicable NRC guidance to assure all requirements of a Process Control Program have been addressed. Review documents shall include:

8.1.1.1 NUREG-0133.

8.1.1.2 NUREG-0472.

8.1.1.3 NUREG-0800.

8.1.1.4 Branch Technical Position - ETBS 11-3.

8.1.1.5 Appendix 11.4-A, "Design Guidance for Temporary Storage...".

8.1.1.6 NRC Review Criteria for Solid Waste Management Systems.

8.1.1.7 Site-specific Technical Specifications.

8.1.2 Changes to the Corporate Process Control Program shall be approved by the System Radwaste Engineer and each station's Technical Services Superintendent prior to implementation.

8.1.3 Each Station Manager shall document that any changes to the Corporate Process Control Program have been reviewed and approved (per Steps 8.1.1 and 8.1.2).

8.1.4 The Nuclear Safety Review Board shall review the activities of the Station Manager detailed in Step 8.1.3.

8.1.5 A record of the review (per Step 8.1.4) shall be sent to the Vice President, Nuclear Production and the Executive Vice President, Power Operations within fourteen (14) days following completion of the review.

8.1.6 All changes to the Corporate PCP shall be sent to the NRC in each station's Semi-annual Radioactive Effluent Report for the period in which the changes were implemented.

8.1.7 Changes to all implementing procedures shall be reviewed by station radwaste or health physics staff and approved by the station's Technical Services Superintendent prior to implementation.

8.1.7.1 Changes to implementing procedures shall be reviewed by the Technical Services Superintendent to assure they do not conflict with the Corporate Process Control Program.

8.1.8 Records shall be maintained documenting the requirements of Section 8.1. Records shall be maintained for six (6) years (per the Administrative Policy Manual).

9.0 AUDITS

9.1 Program Requirements

9.1.1 The Corporate Process Control Program and station implementing procedures shall be audited at least once per twenty four months at each station.

9.1.2 This audit shall be performed under the cognizance of the NSRB.

9.1.3 Audit reports shall be forwarded to the Vice President, Nuclear Production, Executive Vice President, Power Operations; and Station Manager within thirty (30) days of completion of the audit.

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HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

November 29, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414
Process Control Program

Dear Mr. Denton:

In response to your letter dated September 14, 1984 requesting additional information regarding Catawba's Process Control Program (PCP), and as committed to in my October 3, 1984 letter please find attached the Catawba specific PCP.

Very truly yours,

Hal B. Tucker

RWO:slb

Attachment

cc: Mr. James P. O'Reilly, Regional Administrator
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