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Nuclear Power Plant
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New York Power Authority

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RADIOLOGICAL & ENVIRONMENTAL SERVICES PROCEDURES (PORC)

PROCEDURE NO. RE - PCP - _____, REV. 2

TITLE: "SOLID RADIOACTIVE WASTE PROCESS CONTROL PROGRAM"

"THIS PROCEDURE HAS BEEN EXTENSIVELY REVISED"

Written By: _____

Reviewed By: _____

PORC Review: _____ Date 5/10/93

Approved By: _____ Date 5/11/93

Effective Date: 5/11/93

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SOLID RADIOACTIVE WASTE PROCESS CONTROL PROGRAM

1.0 PURPOSE

The purpose of this document is to provide instructional guidance and a description of the solid radioactive waste Process Control Program (PCP) at the Indian Point No. 3 Nuclear Plant (Plant). The PCP describes the methods used for processing, classification and packaging low-level radioactive waste into a form acceptable for disposal, in accordance with 10 CFR Part 61 and current disposal site criteria.

2.0 SCOPE

This procedure describes current and planned practices for sampling, classification, processing and packaging of radioactive waste. This procedure does not address irradiated hardware which will be managed on a case-by-case basis under the direction of the Waste Management General Supervisor.

2.1 Waste Stream Identification

The Plant has identified seven different waste streams and treats each separately for classification purposes. Examples of current active waste streams are as follows:

a) Dry Active Waste (DAW).

b) Primary Resin.

c) Cartridge Filters.

d) Liquid Waste Processing (LWP) D-70 Media.

e) LWP Activated Charcoal.

f) LWP Anion Resin.

g) LWP Cation Resin.

2.2 Disposition of Radioactive Material Sent to a Vendor for Intermediate Processing

Current and planned practices include sending radioactive material generated by the Plant to SEG or other vendors for volume reduction (VR) processing instead of directly to a disposal site.

2.2.1 This procedure addresses the requirements for 10CFR Part 61.55 (waste classification) for radioactive material sent to vendor facilities.

2.2.2 This procedure does NOT address the requirements for 10CFR Part 61.56 (waste characteristics) for material sent to intermediate processors, because the final treatment and packaging is performed at the vendor facilities.

2.2.3 The types of radioactive material sent to intermediate processors could include, but is not limited to, the following:

- DAW
- Steam Generator Blowdown Resin
- Steam Generator Blowdown Filters
- Contaminated Oil
- Contaminated Soil

2.3 Disposition of Radioactive Material Sent Directly to a Disposal Site

This procedure addresses both the 10CFR Part 61.55 and Part 61.56 requirements for the waste streams listed in Section 2.1.

3.0 REFERENCES

3.1 Federal Regulations

3.1.1 Code of Federal Regulations, Title 10, Part 20.

3.1.2 Code of Federal Regulations, Title 10, Part 61.

3.2 Plant Procedures

3.2.1 Quality Assurance Procedure Manual Section 18.1, "Quality Assurance Audit Program".

3.2.2 Quality Assurance Instructions, QAI 1.3, "Process Control Program (PCP), Tech Spec B QA Surveillance Plan".

3.2.3 RE-ADM-1-1, "RES procedure Preparation, Review & Approval".

3.2.4 RE-ADM-1-4, "RES Department Commitment Tracking System".

3.2.5 RE-ADM-1-5, "RES Self-Assessment Program".

3.2.6 RE-REA-4-13, "Spent Resin Handling".

3.2.7 RE-RMC-11-2, "Identification & Control of Radioactive Material".

3.2.8 RE-RWM-12-2, "Demineralizer Liquid Waste Processing System".

3.2.9 RE-RWM-12-3, "Waste Classification Compliance Program".

3.2.10 RE-RWM-12-5, "Handling Procedure for NuPac 14D-2.0 Shielded Shipping Cask".

3.2.11 RE-RWM-12-6, "Radioactive Waste Handling & Packaging".

3.2.12 RE-RWM-12-7, "Operation of the Portable Mechanical Filter NF-50".

3.2.13 RE-RWM-12-9, "Maintenance of Nuclear Plant Filters".

3.2.14 RE-RWM-12-19, "Use of the RADMAN Computer Code".

3.2.15 RE-RWM-12-21, "Use & Handling of Polyethylene High Integrity Containers".

3.2.16 RE-RWM-12-22, "HN-200 Shielded Cask Handling".

3.2.17 RE-RWM-12-23, "Use of the DEMTRK Computer Code".

3.2.18 RE-RWM-12-26, "Use of the FILTRK Computer Code".

3.2.19 RE-RWM-12-27, "Use & Handling of the NuPac 10-142 Type B Cask".

3.2.20 RE-RWM-12-30, "Waste Management Task Scheduling".

3.2.21 RE-RWM-12-35, "Spent Resin Transfer".

3.2.22 RE-RWM-12-40, "Use of the Westinghouse DOT 2R/20WC Cask".

3.2.23 RE-RWM-12-42, "Operation of the Waste Compactor for Drums".

3.2.24 RE-RWM-12-43, "Operation of the B-100 Waste Compactor for Crates".

3.2.25 RE-RWM-12-44, "Use of the Underwater Filter System".

3.2.26 RE-RWM-12-45, "Use of the TRASHP Computer Code".

3.2.27 RE-RWM-12-47, "Installation of Pall Filter Co. Nuclear Plant Filters".

3.2.28 RE-RWM-12-48, "Spent Resin Transfer Using the NuPac Resin Drying System".

3.2.29 RE-TRA-15-13, "Radwaste Utility Operator Qualification Program".

3.2.30 RE-TRA-15-15, "Senior Radwaste Utility Operator Qualification Program".

3.3 Disposal Site Requirements

3.3.1 Barnwell Waste Management Facility site disposal criteria.

3.3.2 Barnwell (South Carolina) disposal site license.

3.3.3 Richland (Washington) disposal site license.

3.4 NRC Information Notices

3.4.1 NRC Information and Enforcement Bulletin 79-19: Packaging of Low-Level Radioactive Waste for Transport and Burial

3.4.2 NRC Information Notice 80-24: Low-Level Radioactive Waste Burial Criteria

3.4.3 NRC Information Notice 80-32: Clarification of Certain Requirements for Exclusive-Use Shipments of Radioactive Materials

3.4.4 NRC Information Notice 80-32, Rev. 1: Clarification of Certain Requirements for Exclusive-Use Shipments of Radioactive Materials

3.4.5 NRC Information Notice 83-05: Obtaining Approval for Disposing of Very-Low-Level Radioactive Waste - 10CFR Section 20.302

3.4.6 NRC Information Notice 83-10: Clarification of Several Aspects Relating to Use of NRC-Certified Transport Packages

3.4.7 NRC Information Notice 83-33: Non-Representative Sampling of Contaminated Oil

3.4.8 NRC Information Notice 84-50: Clarification of Scope of Quality Assurance Programs for Transport Packages Pursuant to 10CFR 50 Appendix B

3.4.9 NRC Information Notice 84-72: Clarification of Conditions for Waste Shipments Subject to Hydrogen Gas Generation

3.4.10 NRC Information Notice 85-92: Surveys of Wastes Before Disposal from Nuclear Reactor Facilities

3.4.11 NRC Information Notice 86-20: Low-Level Radioactive Waste Scaling Factors, 10CFR 61

3.4.12 NRC Information Notice 86-90: Requests to Dispose of Very Low-Level Radioactive Waste Pursuant 10CFR 20.302

3.4.13 NRC Information Notice 87-03: Segregation of Hazardous and Low-Level Radioactive Wastes

3.4.14 NRC Information Notice 87-07: Quality Control of On-Site Dewatering/Solidification Operations by Outside Contractors

3.4.15 NRC Information Notice 89-27: Limitations on the Use of Waste Forms and High Integrity Containers for the Disposal of Low-Level Radioactive Waste

3.4.16 NRC Information Notice 92-62: Emergency Response Information Requirements for Radioactive Material Shipments

3.4.17 NRC Information Notice 92-72: Employee Training and Shipper Registration Requirements for Transporting Radioactive Materials

3.5 Vendor Procedures

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NOTE

The operational aspects of vendor procedures are incorporated into site-specific procedures for each particular process listed in Section 3.2 of this procedure.

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3.5.1 Pacific Nuclear Systems, Inc. Q.A. Manual, latest revision.

3.5.2 Nuclear Packaging, Inc., Dewatering System Topical Report No. TP-02-NP-1, Rev. 0.

3.5.3 Chem-Nuclear Systems, Inc. Q.A. Program Document No. QA-AD-001, latest revision.

3.5.4 Chem-Nuclear Systems, Inc. Dewatering Control Process Containers Topical Report No. DW-11118-01-NP-A.

3.5.5 Scientific Ecology Group, Inc. Q.A. Program No. SEG/QA-100, latest revision.

3.5.6 Westinghouse-Hittman Nuclear, Inc. Mobil In-Container Dewatering and Solidification System Topical Report #STD-R-05-011NP-A.

3.5.7 TFC Nuclear Associates, Inc. Q.A. Manual.

3.5.8 TFC Nuclear Associates, Inc. Dewatering Test Report of NUHIC-120D (BR) Bead Resin, 1984.

3.5.9 TFC Nuclear Associates Topical Report for High Integrity Containers No. TFC-TV-84.

3.5.10 "RADMAN - A Computer Code", Main Topical Report.

3.5.11 NRC Acceptance Letter: RADMAN Topical Report, July 25, 1983.

4.0 RESPONSIBILITIES

The Waste Management General Supervisor has the overall responsibility for implementing the PCP. The Waste Management Processing and Transportation Supervisor is tasked with the day-to-day responsibilities for the following:

a) Implementing this procedure.

b) Ensuring that radioactive waste is characterized and classified in accordance with 10CFR Part 61.55 and Part 61.56.

c) Ensuring that radioactive waste is characterized and classified in accordance with volume reduction facility and disposal site licenses and other requirements.

d) Designating other approved procedures (if required) to be implemented in the packaging of any specific batch of waste.

e) Providing a designated regulatory point of contact between the Plant and the NRC, or volume reduction facility or disposal site.

f) Maintaining records of on-site and off-site waste stream sample analysis and Plant evaluations.

5.0 DEFINITIONS

5.1 Definitions

5.1.1 Batch - An isolated quantity of feed waste to be processed having essentially constant physical and chemical characteristics. (The addition or removal of water will not be considered to create a new batch).

5.1.2 Chelating Agents - EDTA, DTPA, hydroxy-carboxylic acids, citric acid, carbolic acid and glucinic acid.

5.1.3 Confirmatory Analysis - The practice of verifying that gross radioactivity measurements using MCA are reasonably consistent with independent laboratory sample data.

5.1.4 Density Correction - The factor which converts sample data reported in uCi/g to uCi/cc prior to characterization using the RADMAN core sample mode.

5.1.5 Dewatered Waste - Wet waste that has been processed by means other than solidification, encapsulation, or absorption to meet the free standing liquid requirements of 10CFR Part 61.56 (a)(3) and (b)(2).

5.1.6 Dilution Factor - The RADMAN computer code factor to account for the non-radioactive binder added to the waste stream in the final product when waste is solidified.

5.1.7 Encapsulation - Encapsulation is a means of providing stability for certain types of waste by surrounding the waste by an appropriate encapsulation media.

5.1.8 Gamma-Spectral-Analysis - Also known as IG, MCA, Ge/Li and gamma spectroscopy.

5.1.9 Gross Radioactivity Measurements - More commonly known as dose to curie conversion for packaged waste characterization and classification.

5.1.10 Homogeneous - Of the same kind or nature; essentially alike. Most waste streams are considered homogeneous for purposes of waste classification.

5.1.11 Low-Level Radioactive Waste (LLW) - Those wastes containing source, special nuclear, or by-product material that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level radioactive 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 by-product material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).

5.1.12 Measurement of Specific Radionuclides - More commonly known as direct sample or container sample using MCA data for packaged waste characterization and classification.

5.1.13 Operable - A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified functions(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

5.1.14 Prequalification Program - The testing program implemented to demonstrate that the proposed method of wet waste processing will result in a waste form acceptable to the land disposal facility and the NRC.

5.1.15 Processing - Changing, modifying, and/or packaging wet radioactive waste into a form that is acceptable to a disposal facility.

5.1.16 Quality Assurance/Quality Control - As used in this document, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to the physical characteristics of a material structure, component, or system to predetermined requirements.

5.1.17 Sampling Plan - A program to ensure that representative samples from the feed waste and the final waste form are obtained and tested for conformance with parameters stated in the PCP and waste form acceptance criteria.

5.1.18 Scaling Factor - A dimensionless number which relates the concentration of an easy to measure radionuclide (gamma emitter) to one which is difficult to measure (beta and/or alpha emitters).

5.1.19 Significant Quantity - For purposes of waste classification all the following radionuclide values shall be considered significant and must be reported on the disposal manifest.

- Any value (real or LLD) for a 10CFR Part 20.311 required radionuclide.
- Greater than or equal to 1 percent of the concentration limits listed in 10CFR Part 61.55 Table 1.
- Greater than or equal to 1 percent of the Class A concentration limits listed in 10CFR Part 61.55 Table 2.
- Greater than or equal to 1 percent of the total activity.
- Greater than or equal to 1 percent of the Reportable Quantity limits listed in 49CFR Part 172.101 Table 2.

5.1.20 Special Radionuclides - The RADMAN computer code term for 10CFR Part 20.311 required radionuclides.

5.1.21 Stability - As used in this document, "stability" means structural stability. Stability requires that the waste form maintain its structural integrity under the expected disposal conditions.

5.1.22 Training - A systematic program that ensures a person has knowledge of hazardous materials and hazardous materials regulations.

5.1.23 Type A Package - Is the packaging together with its radioactive contents limited to A_1 or A_2 as appropriate that meets the requirements of 49CFR Part 173.410 and Part 173.412, and is designed to retain the integrity of containment and shielding under normal conditions of transport as demonstrated by the tests set forth in 49CFR Part 173.465 or Part 173.466 as appropriate.

5.1.24 Type B Package - Is the packaging together with its radioactive contents that is designed to retain the integrity of containment and shielding when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10CFR Part 71.

5.1.25 Waste Container - A vessel of any shape, size, and composition used to contain the final processed waste.

5.1.26 Waste Form - Waste in a waste container acceptable for disposal at a licensed disposal facility.

5.1.27 Waste Stream - A Plant specific and constant source of waste with a distinct radionuclide content and distribution.

5.1.28 Waste Type - A single packaging configuration and waste form tied to a specific waste stream.

6.0 PREREQUISITES

6.1 Maintenance of Regulatory Material

Ensure that a current set of DOT, NRC, EPA, New York State, Volume Reduction facility and disposal site regulations and requirements are maintained at the Plant and are readily available for reference.

6.2 Representative Radionuclide Sample Data

Ensure that representative radionuclide sample data is on file for each active waste stream. Unless operation conditions or changes in processing methods require increased sample frequency, data is considered to be current if it meets the following:

a) NRC Class "A" waste streams must be sampled at least every two years.

b) NRC Class "B" or "C" waste streams and waste streams that haves the potential to be NRC Class "B" or "C" must be sampled at least every year.

6.3 Initial and Cyclic Training

A training program shall be developed, implemented and maintained for all personnel involved in processing, packaging, handling and transportation of radioactive waste to ensure radwaste operations are performed within the requirements of NRC Information Bulletin 79-19 and 49CFR Part 172.700 through Part 172.704.

Specific employee training is required for each person who performs the following job functions [172.702(b)].

a) Classifies hazardous materials.

b) Packages hazardous materials.

c) Marks and labels packages containing hazardous materials.

d) Prepares shipping papers for hazardous materials.

e) Offers or accepts hazardous materials for transportation.

f) Handles hazardous materials.

g) Marks or placards transport vehicles.

h) Operates or crews transport vehicles.

i) Works in a transportation facility and performs functions in proximity to hazardous materials which are to be transported.

j) Inspects or tests packages.

Cyclic training is defined as within two years.

Copies of training records are required for as long as a person is employed and 90 days thereafter. The records should include, as a minimum, the following:

a) Trainee's name and signature.

b) Training dates.

c) Training material or source reference.

d) Trainer's name and signature.

6.4 Requirements for Contracted Processing Vendors

Plant management shall review vendor(s) topical reports and test procedures.

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NOTE

The PCP does not have to include the vendor's Topical Report if it has NRC approval, or has been previously submitted to the NRC.

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Plant management review will assure that the vendor's operations and requirements are compatible with the responsibilities and operation of the Plant.

Training requirements and records listed in Section 6.3 also apply to contracted vendors.

7.0 PRECAUTIONS/LIMITATIONS

7.1 Precautions

a) Radioactive materials shall be handled in accordance with applicable radiation protection procedures.

b) All radioactive waste must be processed or packaged to meet the minimum requirements listed in 10CFR Part 61.56 (1) through (8).

7.2 Limitations

a) Only personnel authorized by the Waste Management General Supervisor will characterize or package radioactive waste or radioactive materials.

b) All Plant personnel that have any involvement with radioactive waste management computer software shall be familiar with its functions, operation and maintenance.

8.0 SPECIAL TOOLS AND EQUIPMENT

8.1 Frequency of Use and Descriptions

Required tools and equipment will vary depending on the specific process and waste container that is used. The various tools and equipment which may be required are detailed in the vendor procedures listed in the Section 3.0 of this procedure.

9.0 PROCEDURE

9.1 Waste Management Practices

9.1.1 Solidification/encapsulation methods include the following:

a) Present and planned practice is NOT to solidify or encapsulate any waste streams.

b) All liquid waste is dewatered to less than 1 percent by volume prior to shipment.

9.1.2 Operation and maintenance of dewatering systems and equipment include the following:

a) Present and planned practice is to utilize Plant personnel, supplemented by contracted vendor personnel, on a demand basis to operate and maintain dewatering systems and equipment using Plant procedures.

b) All disposal liners are manufactured by and purchased from QA approved vendors.

9.1.3 High integrity container usage includes the following:

a) High Integrity Containers (fabricated from high density cross-linked polyethylene) may be used as the disposal container for NRC Class "A" waste.

b) High Integrity Containers may also be used for NRC Class "B" and Class "C" waste, but enhanced structural stability is required for polyethylene HICS received at the CNSI Barnwell disposal site.

c) Enhanced structural stability to meet the requirements of 10CFR Part 61.56 and the State of South Carolina is accomplished by the use of DHEC approved concrete overpack structures at the Barnwell disposal site.

9.1.4 ALARA considerations are addressed in all phases of the processes involving handling, packaging and transfer of any type or form of radioactive waste (dewatered or dry). All spent resins, spent filter cartridges and sludges are processed within shields (normally the shipping cask). Sluiceable demineralizers are shielded when in service. Radiation exposure and other health physics requirements are controlled by the issuance of a Radiation Work Permit (RWP) for each task.

9.2 Waste Stream Sampling Methods and Frequency

9.2.1 The following general requirements apply to Plant waste stream sampling:

(a) Treat each waste stream separately for classification purposes.

(b) Meet the minimum sample frequency requirements as stated in Section 6.2.

(c) Ensure samples are representative of or can be correlated to the final waste form.

(d) Determine the density for each waste stream (not applicable for DAW and filters).

(e) Perform an in-house analysis for gamma emitting radionuclides for each sample sent to an independent laboratory.

(f) Periodically perform in-house analysis for gamma emitting radionuclides for comparison to the current data base values for gamma emitters. (The current data base is usually based on the most recent independent laboratory results.)

(g) Resolve any discrepancies between in-house results and the independent laboratory results for the same or replicate sample as soon as possible.

(h) Maintain records of on-site and off-site waste stream sample analysis and evaluations.

9.2.2 The following conditions may require increased sampling frequencies relative to the requirements in Section 6.2:

a) When reactor coolant Dose Equivalent Iodine approaches 25 percent of the Plant technical specification limit.

b) When there is a significant increase of the reactor coolant I-131/I-133 ratio at steady state power.

c) When Np-239 activity is greater than .01 uCi/cc in the reactor coolant.

d) If alpha analyses result in alpha to beta-gamma ratios significantly in excess of the trigger levels established by Radiological Engineering. The occasional exceedance of the trigger values is expected and does not necessarily warrant increased sampling frequency.

e) When there is an extended reactor shutdown (> 90 days).

f) When there are changes to liquid waste processing, such as bypassing filters, utilizing filters or a change in ion exchange media.

9.2.3 The following requirements apply to infrequent or abnormal waste types:

a) Infrequent or abnormal waste types that may be generated must be evaluated on a case-by-case basis.

b) The Waste Processing and Transportation Supervisor will determine if the waste can be correlated to an existing waste stream.

c) If the radioactive waste cannot be correlated to an existing waste stream, the Waste Processing and Transportation Supervisor shall determine specific off-site sampling and analysis requirements necessary to properly classify the material.

9.2.4 Specific sampling methods and data evaluation criteria are detailed in RE-RWM-12-3 for each active waste stream.

9.3 Waste Classification

Specific classification steps for each active waste type are detailed in RE-RWM-12-3 and specific radioactive material management software operating procedures.

9.3.1 General requirements for scaling factors include the following:

a) The Plant has established an inferential measurement program whereby concentrations of radionuclides which cannot be readily measured are estimated through ratioing with radionuclides which can be readily measured.

b) Scaling factor relationships are developed on a waste stream specific basis. These relationships are periodically revised to reflect current independent lab data from direct measurement of samples. The scaling factor relationships currently used by the Plant are as follows:

- Hard to detect ACTIVATION product radionuclides and C-14 are estimated by using scaling factors with measured Co-60 activities.

- Hard to detect FISSION product radionuclides and H-3, Tc-99 and I-129 are estimated by using scaling factors with measured Cs-137 activities.

- Hard to detect TRANSURANIC radionuclides are estimated by using scaling factors with measured Ce-144 activities. Where Ce-144 cannot be readily measured, transuranics are estimated by using scaling factors with measured Cs-137 activities.

9.3.2 General requirements for the determination of total activity and radio-nuclide concentrations include the following:

a) The activity for the waste streams defined in Section 2.1 is estimated by using either Gross Radioactivity Measurement or Direct Measurement of Radionuclides. Current specific practices are as follows:

- DAW - Gross radioactivity measurement in conjunction with the RADMAN and TRASHP computer codes, other approved computer codes or hand calculation.

- Filters - Gross radioactivity measurement in conjunction with the FILTRK computer code, other approved computer codes or hand calculation.

- All Other Waste Streams - Direct measurement of radionuclides in conjunction with the RADMAN and TRASHP computer codes, other approved computer codes or hand calculation.

b) Determination of the NRC waste classification is performed by comparing the measured or calculated concentrations of significant radionuclides in the final waste form to those listed in 10CFR Part 61.55.

9.4 Quality Control for Sampling and Classification

9.4.1 The RADMAN computer code provides a mechanism to assist the Plant in conducting a quality control program in accordance with the waste classification requirements listed in 10CFR Part 61.55. All waste stream sample data changes are written to a computer data file for future review and reference.

9.4.2 Audit Frequency and Management Review includes the following:

a) 10CFR Part 20.311 requires periodic audits which must include management reviews.

b) Management audits of the Plant Sampling and Classification Program shall be periodically performed to verify the adequacy of maintenance sampling and analysis.

c) Audits are performed and documented by any of the following:

- Radiation Protection Department.
- Corporate Radiation Protection Staff.
- Quality Assurance Department.
- Qualified Vendors.

d) The Plant audit program is detailed in the Plant Quality Assurance Procedure manual in Section 18.1. This program is supplemented by Quality Assurance Instruction 1.3.

9.5 Dewatering Operations

9.5.1 Processing requirements during dewatering operations include the following:

a) All dewatering operations are performed per approved Plant or vendor operating procedures and instructions.

b) Dewatering limitations and capabilities are verified by vendor Topical Reports or Operating and Testing Procedures.

9.5.2 Dewatered resin activity limitations include the following:

a) Dewatered resins will not be shipped off-site that have activities which will produce greater than 1.0E+8 rads total accumulated dose over 300 years. This is usually verified by comparing the container specific activity at the time of shipment to the following concentration limits for radionuclides with a half-life greater than five years:

- 10 Ci (0.37 TBq) per cubic foot.
- 350 uCi (8.75E-3Bq) per cubic centimeter.

9.6 Additional Barnwell Waste Management Facility Requirements

NRC Class A waste which exceeds 1 uCi/cc (for radionuclides with a half-life greater than five years) must meet the DHEC/CNSI stability requirement defined in the Barnwell Site Criteria.

Each container of waste must be clearly labeled to identify whether it is Class "A" waste, Class "B" waste, or Class "C" waste, in accordance with 10CFR Part 61.55.

Arrange for Class "B" and Class "C" waste, received at the Barnwell facility in polyethylene HICs, to be disposed within approved disposal overpacks.

Void spaces within the waste and between the waste and its packaging shall be reduced to the extent practicable, but in NO case shall less than 85 percent of the capacity of the container be filled.

The Waste Processing and Transportation Supervisor must apply for a variance request prior to shipment if the 85 percent fill requirement is NOT achievable.

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NOTE

The South Carolina DHEC and CNSI recognize that filters and irradiated hardware will NOT routinely meet the 85 percent condition. Provided that containers of these wastes types are packaged to the fullest extent practicable, no written justification is required.

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Only personnel designated in writing as official representatives of the New York Power Authority can sign the Barnwell Waste Management Facility, Radioactive Shipment Manifest Form certification statements (blocks 18 and 19 on the manifest cover sheet).

9.7 Waste Packaging

Specific packaging types and instructions for each waste stream are detailed in RE-RWM-12-6.

9.7.1 General requirements which apply to most routine Class "A" waste packages for metal drums, boxes and liners are as follows:

a) Ensure that each package can be easily handled and secured during transportation.

b) Ensure that packages with a gross weight exceeding 22 pounds (10 kg), but less than or equal to 110 pounds (50 kg) shall have a means for manual handling.

c) Ensure that packages with a gross weight exceeding 110 pounds (50 kg) shall be designed for mechanical handling.

d) Ensure that packages with installed lifting attachments are designed with a minimum safety factor of three.

e) Ensure that the external surface of any package can be easily decontaminated.

f) Ensure that the package is designed to minimize pockets or crevices that could collect water.

9.7.2 General requirements which apply to most Class "B" and "C" waste packages, excluding packages containing irradiated hardware, are as follows:

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NOTE

The following general requirements are normally verified by review of a HIC's Certificate of Compliance (C of C) and state and/or NRC approval.

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a) Ensure that the waste is in a container or structure that provides stability after disposal.

b) Ensure that the container is resistant to degradation caused by radiation effects.

c) Ensure that the container is resistant to biodegradation.

d) Verify that the container will remain stable under the compressive loads inherent in the disposal environment.

e) Verify that the container will remain stable if exposed to moisture or water after disposal.

f) Ensure that the as-generated waste is compatible with the container.

9.7.3 General requirements for vendor packages are as follows:

a) Perform all inspection, handling and loading operations per approved Plant and/or vendor instructions and procedures.

b) Store each container with its designated closure assemblies to prevent mismatching.

9.7.4 General requirements for inspection prior to use includes the following:

a) Visually inspect thread and seal areas to verify they are free of foreign matter that could impair the thread or seal engagement.

b) Visually inspect the exterior surfaces for damage that may have occurred during transport or storage that could lessen container integrity.

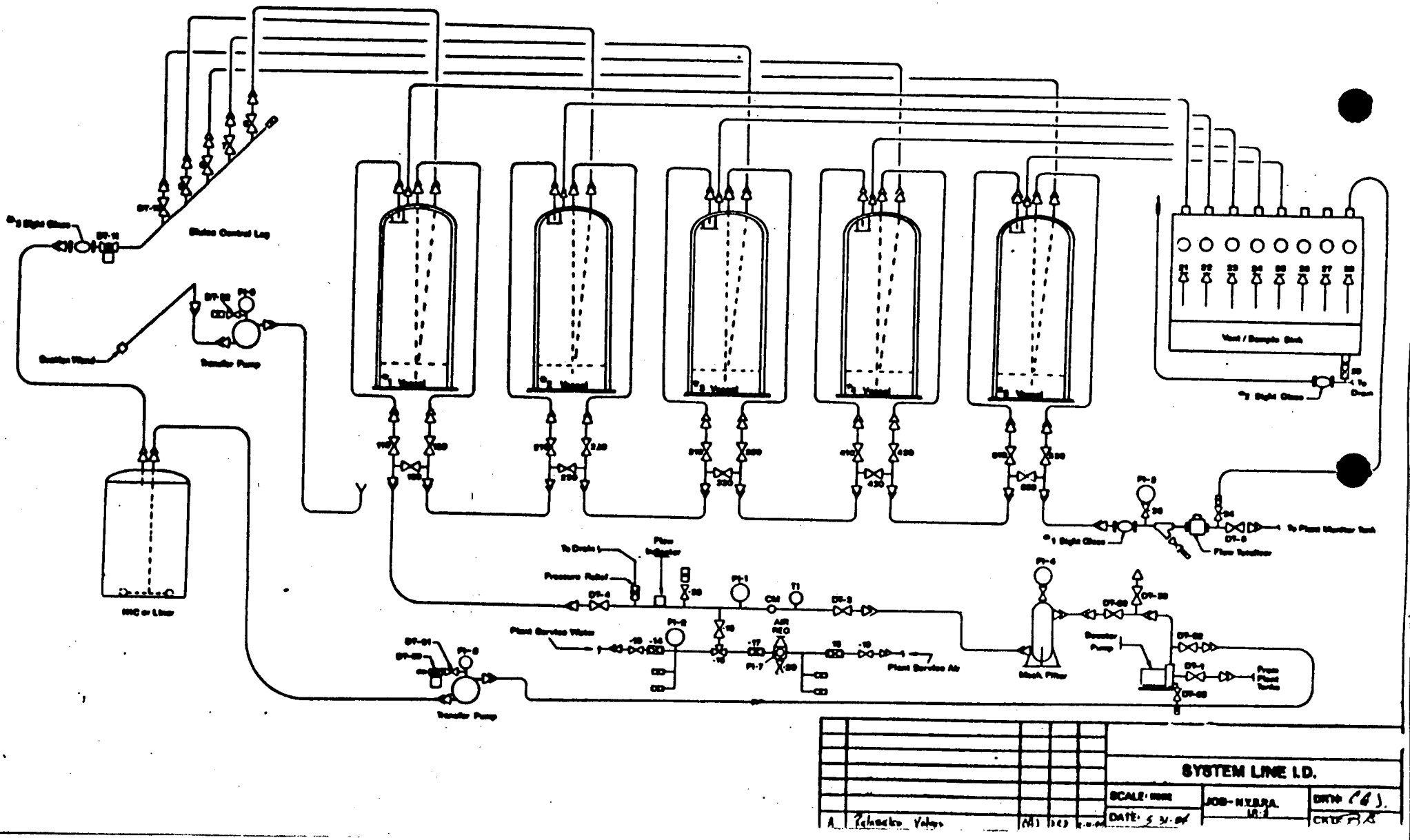
c) Visually inspect the manway lid for sufficient closure.

10.0 ATTACHMENTS

10.1 Block diagram of the typical vendor-supplied waste processing system.

10.2 Block diagram of a typical vendor's heat-enhanced dewatering system (HED). May be used on HICS and liners with dewatering internals installed.

10.3 Block diagram, generic dewatering system.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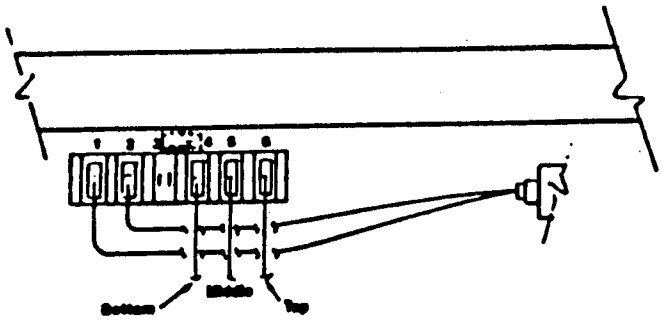
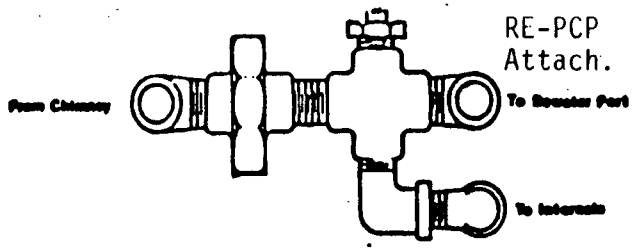
Pressure Relief
Plant Service Water
Plant Service Air
Mech. Filter
SYSTEM LINE I.D.

RE-PCP
Attach. 10.2



DETAIL #1

T.C. JUNCTION BOX



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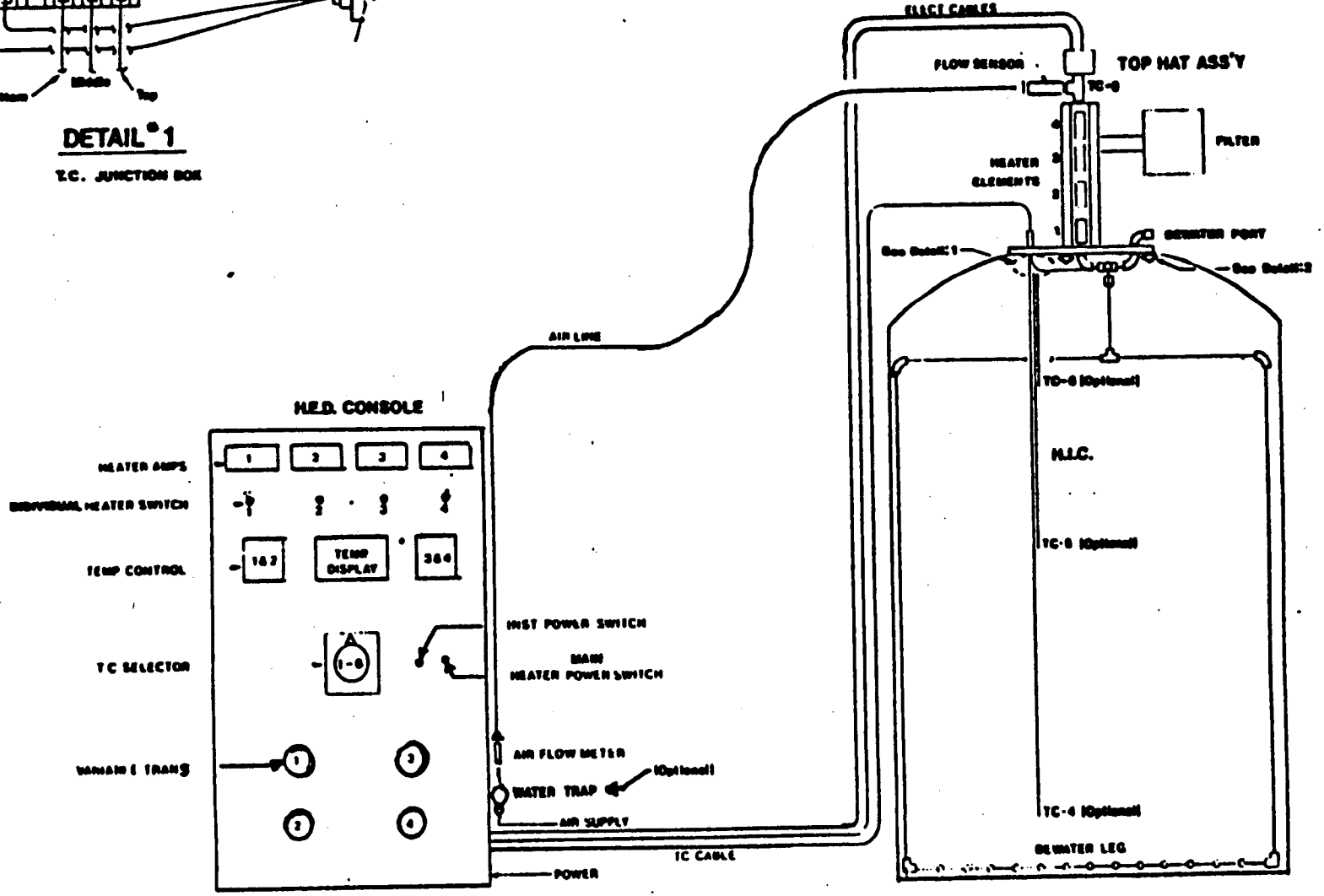
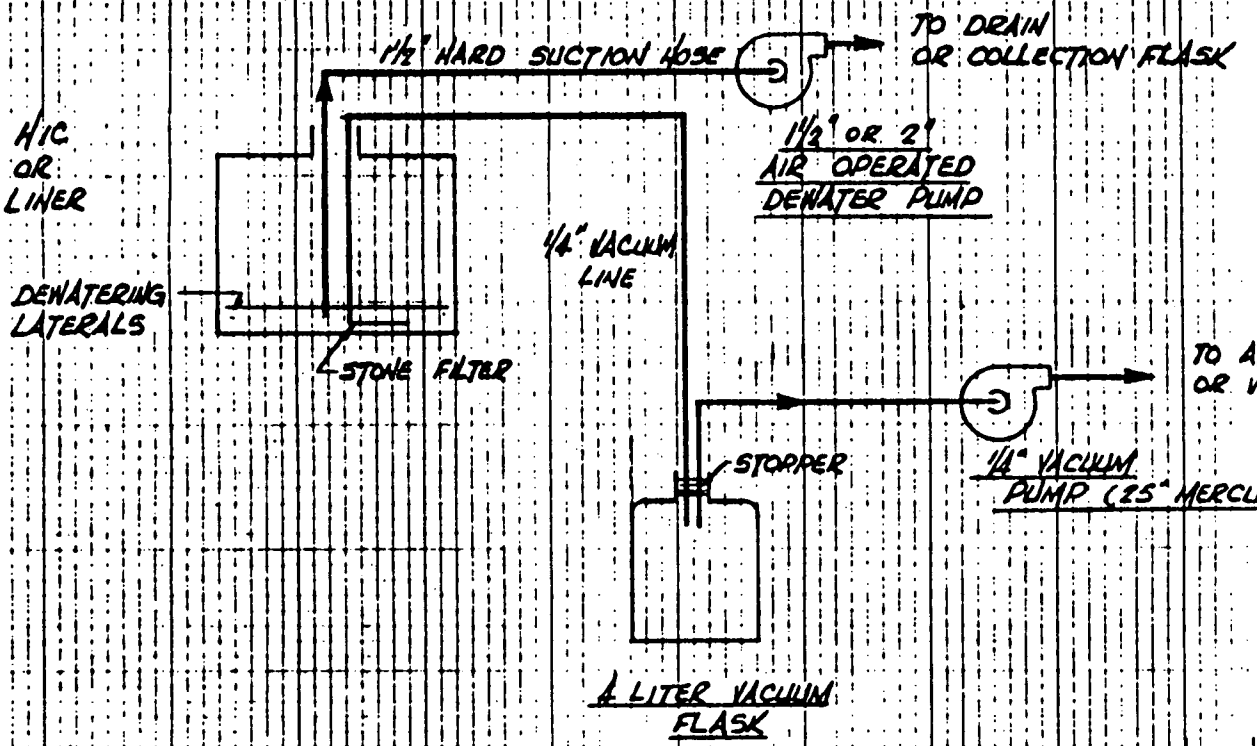


	DRAWN [illegible]	JOB-H.E.D.S.	APPD	H.E.D. SYSTEM
	DATE [illegible]	DWG H.E.D.S-8	CKD	
	APPD [illegible]		APPD	



NO	DESCRIPTION		
	REVISIONS		

POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT NO. 3 NUCLEAR POWER PLANT

TITLE: GENERIC DEWATERING SYSTEM

MODIFICATION No.: | SCALE: | DRAWN BY: J. Feldt

DATE	APPROVED BY	DRAWING NUMBER
7-7-88		SK-7788

SEMI-ANNUAL RELEASE REPORT

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