

ATTACHMENT 4

TO

Letter from C. R. Steinhardt (WPSC)

to

Document Control Desk (NRC)

Dated

May 4, 1993

Kewaunee Nuclear Power Plant

Process Control Program

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<p>Wisconsin Public Service Corporation</p> <p>NUCLEAR ADMINISTRATIVE DIRECTIVE</p>	<p>NAD No. 1.16 Rev. Orig</p> <p>Title: Solid Radioactive Waste Process Control Program (PCP)</p> <p>Date: APR 16 1993 Page 1 of 8</p>
<p>Reviewed By <u><i>M. R. Ricketts</i></u> Responsible Dept. Head</p> <p>Reviewed By <u><i>J. LoSne</i></u> FOR Superintendent - Quality Assurance or Plant Quality Programs</p>	<p>PORC Review <u><i>Clare Berg</i></u> 93-001.5 PORC Secretary</p> <p>Approved By <u><i>M. M. M. M.</i></u> Responsible Manager or Senior Vice President - Nuclear Power</p>

1.0 PURPOSE

This Process Control Program covers the analysis, processing and packaging of solidified radioactive wastes in order to produce a final waste form that is acceptable for transportation and burial at a licensed radioactive waste disposal site.

This program implements the requirements of 10CFR Part 50.36a and General Design Criterion 60 of Appendix A to 10CFR 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.

This directive:

- 1.1 defines personnel responsibilities for the processing of radioactive waste streams for disposal.
- 1.2 documents the methods used and the quality control steps involved in assuring compliance with 10CFR61.56 regarding waste stability characteristics.
- 1.3 verifies the solidification of each type of wet radioactive waste (e.g., filter sludges, spent resins, evaporator bottoms, boric acid solutions, and sodium sulfate solutions).

NOTE: PORC review of revisions to this directive required per Tech. Spec. 6.17.

2.0 APPLICABILITY

This program applies to each radioactive waste stream which routinely requires processing and packaging for off-site disposal as solid radioactive waste. These waste streams are:

- 2.1 Bead resin from the Chemical and Volume Control System (CVCS), the Spent Fuel Pool Cleanup System and the Liquid Radwaste Processing System.

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- 2.2 Filter media, including cloth and polypropylene bag filters, spun cotton filter cartridges, and metal cartridge filters from the CVCS, Spent Fuel Pool Cleanup System, Laundry System, Reactor Coolant System, and the Liquid Radwaste Processing System. Also included here, are cotton mop heads used during plant area decontamination activities.
- 2.3 Dry Active Waste (DAW) consisting of contaminated plastic bags, sheeting, etc.; rags; wood; paper; scrap metal such as valves, piping or tubing, etc. from operational and maintenance activities conducted within the radiologically controlled areas of the plant.

3.0 DEFINITIONS

- 3.1 Free Standing Liquid - drainable liquid or free liquid able to be removed from a waste package through a solidification, absorption, or dewatering process. It includes liquid which is still visible after solidification or dewatering is complete, or is drainable from the low point of a punctured container.
- 3.2 High Integrity Container (HIC) - a waste container used as an alternative to solidifying some waste streams, especially ion exchange resins and filter media/sludges. Provides the long term stability required to meet the structural stability requirements of 10CFR61. Is designed to maintain its structural integrity for 300 years while being subjected to corrosive chemicals, thermal cycling, radiation dose, ultra-violet radiation, transportation, handling and disposal site trench compaction.
- 3.3 Radioactive Waste - any material designated as waste which also contains detectable radioactive material resulting from the operation of the plant.
- 3.4 Solidification - the conversion of wet wastes into a form that meets shipping and burial ground requirements.

4.0 RESPONSIBILITIES

- 4.1 The Superintendent - Plant Radiation Protection has overall responsibility of the solid radioactive waste Process Control Program (PCP).
- 4.2 The Plant Radiation Protection Supervisor is responsible for proper processing, storage, inventory, labeling/marking, surveys and shipment of all radioactive waste in accordance with all applicable Federal, State, County and Burial Site Criteria.

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- 4.3 The Superintendent - Plant Quality Programs is responsible for the periodic inspection/review of all types of radioactive waste shipments to ensure procedural compliance.
- 4.4 The Superintendent - Plant Radiation Protection is responsible to ensure the appropriate approvals and notifications are made when revisions are made to this NAD (See T.S. 6.17).

5.0 REQUIREMENTS

- 5.1 All radioactive waste operations shall be performed in a method to keep doses from radiation as low as reasonably achievable (ALARA).
- 5.2 All radioactive waste shall be shipped only to licensed burial site(s) in accordance with applicable NRC, DOT, and STATE regulations.
- 5.3 All radioactive waste shipments shall be made in accordance with applicable NRC, DOT, STATE and BURIAL SITE regulations and requirements.
- 5.4 A radwaste sampling and analysis program shall be instituted to assure compliance with 10CFR Part 61. Scaling factors will be developed to calculate concentrations of hard to measure isotopes from more easily determined isotopes. The scaling factors will enable concentrations of all 10CFR61 required isotopes to be determined for each radwaste shipment.
- 5.5 Packaging of radwaste shall be in containers meeting NRC, DOT, and BURIAL SITE requirements and regulations.
- 5.6 Each radwaste package shall be assigned a unique identification number for traceability of records.
- 5.7 Container integrity is to be verified by visual examination to assure an acceptable waste package for transportation and an acceptable waste form for disposal.
- 5.8 Transport vehicles will be loaded and prepared for shipment in accordance with written procedures.
- 5.9 Radwaste procedures will contain Quality Control Inspection Hold Points where applicable.
- 5.10 The solid radwaste system shall be used in accordance with the PCP at all times, to process wet radioactive wastes to meet shipping and burial ground

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requirements. With the provisions of the PCP not satisfied, suspend shipments of defectively processed or defectively packaged solid radioactive wastes from the site.

5.11 The Semiannual Radioactive Effluent Release Report shall include the following:

5.11.1 Information for each class of solid waste (as defined by 10CFR Part 61) shipped offsite during the report period:

5.11.1.1 Container volume;

5.11.1.2 Total curie quantity (specify whether determined by measurement or estimate);

5.11.1.3 Principal radionuclides (specify whether determined by measurement or estimate);

5.11.1.4 Source of waste and processing employed (e.g., dewatered spent resin, compacted dry waste, evaporator bottoms);

5.11.1.5 Type of container (e.g., LSA, Type A, Type B, Large Quantity); and

5.11.2 Any changes made during the reporting period to the PCP.

5.12 Processing of Wastes Using the Installed Solidification (Cement) System

5.12.1 Wet radioactive wastes are not processed using the installed cement solidification system at Kewaunee. Instead of solidifying these wastes, the stability requirements of 10CFR61.56(b) are met through the use of high integrity containers which provide stability after disposal.

5.13 Dewatered Resin and Filter Media

5.13.1 As an alternative to solidification, ion exchange resin and filter media may be dewatered in a suitable disposable container. Dewatered Class B and C wastes shall be packaged for disposal into a high integrity container (HIC).

5.13.2 The dewatering process will be conducted in accordance with approved procedures with appropriate operating parameters to assure a waste

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product with as little free standing water as possible, but in no case in excess of 1% by package volume.

5.13.3 Radioactive material content and waste class will be determined based on a pre-established radionuclide distribution and dose rate to curie content conversion in accordance with approved procedures.

5.14 Dry Active Waste (DAW)

5.14.1 Compactable radioactive waste shall be compacted to reduce the volume of the waste.

5.14.2 Non-compactable radioactive waste shall be segregated and packaged separately from compactable waste.

5.14.3 During processing, wastes will be examined to ensure exclusion of unacceptable waste products such as water and oil.

5.14.4 Absorbent materials may be utilized to absorb incidental liquids to ensure no free-standing liquids are contained in the package.

5.14.5 Radioactive material content and waste class will be determined based on a pre-established radionuclide distribution and a dose to curie content conversion in accordance with approved procedures.

5.15 Use of Contractor for Waste Processing

5.15.1 Contractor supplied process and/or service may be used for the processing of radioactive waste for off-site disposal. For the operation of such a process, it may be desirable to use process control measures and procedures developed by the contractor specifically for the system or process. Therefore, previously addressed process control measures for a particular type waste may be superseded by contractor supplied measures as appropriate.

5.15.2 Prior to use of a contractor supplied process or service for waste processing, a management review of the contractor's process control and procedures shall be performed to assure an operation compatible with plant operation and in accordance with regulatory requirements.

5.15.3 For contractor processing of waste that is intended to be shipped for disposal at a licensed radioactive waste burial site, additional precautions

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are to be taken to assure a final waste product that meets the appropriate waste stability requirements of 10CFR61.56. In particular, the following items, as applicable, are to be documented prior to utilization for waste processing:

- 5.15.3.1 A general description of the solidification or dewatering process, including type solidification agent (if applicable), major process equipment and interface with plant equipment, types of waste that can be processed, and operating parameters;
- 5.15.3.2 Process control measures that provide for the verification of the generation of a suitable waste product, including items (as may be appropriate for the process method) such as representative sampling, laboratory tests, and acceptance criteria, etc.
- 5.15.3.3 Specifically approved procedures for the operation of the process equipment that will assure operation within the bounds as delineated by the process control measures; and
- 5.15.3.4 Appropriate acceptance criteria for evaluating the acceptability of the final waste product.

5.16 Quality Assurance

- 5.16.1 There is no requirement for an individual and specific QA program for radwaste per the requirements of 10CFR20.311(d) at Kewaunee. (See COMTRAK 89-302)
- 5.16.2 The appropriate QA controls required by 10CFR20.311(d) are encompassed by:
 - 5.16.2.1 the Operational Quality Assurance Program (OQAP).
 - 5.16.2.2 routine documented QA audits of radwaste processing, packaging, and shipping activities.
 - 5.16.2.3 management evaluation of QA audits.
 - 5.16.2.4 management review and approval of procedures for waste classification and waste characteristics.

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5.16.2.5 management review and approval of procedures for all other radwaste related activities (RC-RW procedures).

5.16.3 Quality Assurance requirements of 10CFR71, Subpart H, apply only to a package containing a Type B quantity of radioactive material. These requirements are satisfied by maintaining documents appropriate to each package used to ship a Type B quantity:

5.16.3.1 Certificate of Compliance (NRC Form 618)

5.16.3.2 Controlled copy of the owner's handling procedure

5.16.3.3 NRC user registration

5.16.3.4 Package safety analysis report

5.16.3.5 Package design analysis

5.16.3.6 Package design drawings

5.16.3.7 Package acceptance test results

5.16.3.8 Package maintenance program

6.0 REFERENCES

6.1 KNP Technical Specification 6.17

6.2 USNRC Waste Form Technical Position, Revision 1, (Letter K-91-011), dated 1/24/91

6.3 NUREG-0800, Rev. 2, July 1981, USNRC Standard Review Plan, Section 11.4, Solid Waste Management Systems

6.4 USNRC Branch Technical Position - ETSB 11-3, Design Guidance for Solid Radioactive Waste Management Systems Installed in Light-Water-Cooled Nuclear Power Reactor Plants, Rev. 2, July 1981

6.5 USNRC Generic Letter 84-12 (K-84-95), Compliance with 10CFR Part 61 and Implementation of the Radiological Effluent Technical Specifications (RETS) and Attendant Process Control Program (PCP), dated 4/30/84

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- 6.6 10CFR20.311, Transfer for Disposal and Manifests
- 6.7 10CFR61, Licensing Requirements for Land Disposal of Radioactive Waste
- 6.8 NUREG-0133, October 1978, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants
- 6.9 NUREG-0472, Revision 3, 9/3/82, Standard Radiological Effluent Technical Specifications for Pressurized Water Reactors
- 6.10 10CFR71, Packaging and Transportation of Radioactive Material
- 6.11 COMTRAK 89-302, Addition of Radwaste QA Program to NAD 1.16
- 6.12 COMTRAK 89-303, PORC Review of NAD 1.16
- 6.13 Letter NRC-84-178, Hintz to Varga, Radiological Effluent Technical Specifications - TAC #08145
- 6.14 49CFR173, Shippers General Requirements for Shipments and Packagings; Subpart I, Radioactive Materials
- 6.15 Barnwell Waste Management Facility Site Disposal Criteria, Chem-Nuclear Systems, Inc., Document S20-AD-010
- 6.16 USNRC License No. 12-13536-01, Barnwell Facility Special Nuclear Material License
- 6.17 South Carolina Department of Health and Environmental Control License No. 097, Barnwell Facility Operating License

7.0 IMPLEMENTING PROCEDURES

- 7.1 Radwaste Procedures (RC-RW Series)
- 7.2 RC-HP-38, Radioactive Material Receipt, Storage and Transfer
- 7.3 RC-HP-138, Radioactive Material Shipment Record