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<b>Procedure Contains NMM ECH eB REFLIB Forms:</b> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
<b>Procedure Revision Type:</b> New <input type="checkbox"/> NON-Editorial <input checked="" type="checkbox"/> Editorial <input type="checkbox"/> TC <input type="checkbox"/> Cancellation <input type="checkbox"/>

<b>HQN Effective Date</b> 8/27/15	<b>Procedure Owner:</b> <b>Title:</b> Donnie Marvel <b>Site:</b> Manager, RP ANO	<b>Governance Owner:</b> <b>Title:</b> Reid Tagliamonte <b>Site:</b> Manager, Fleet RP HQN
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GGNS	Roy Miller	Manager, RP
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PLP	David Nestle	Manager, RP
PNPS	Alan Zelig	Manager, RP
RBS	Shannon Peterkin	Manager, RP
W3	Daniel Frey	Manager, RP
HQN	Reid Tagliamonte	Manager, Fleet RP

**For site implementation dates see ECH eB REFLIB using site tree view (Navigation panel).**

<b><u>Site and NMM Procedures Canceled or Superseded By This Revision</u></b> None
<b><u>Process Applicability Exclusion:</u></b> All Sites: <input type="checkbox"/> Specific Sites: ANO <input type="checkbox"/> BRP <input type="checkbox"/> CNS <input type="checkbox"/> GGNS <input checked="" type="checkbox"/> IPEC <input type="checkbox"/> JAF <input type="checkbox"/> PLP <input type="checkbox"/> PNPS <input type="checkbox"/> RBS <input type="checkbox"/> W3 <input type="checkbox"/>

**Change Statement**


The primary purpose of this revision is to incorporate GGNS Temp Change in response to CR-GGN-2015-1277. Specifically:

- Step 5.1[1](b) added the words "owned by Entergy"
- Added new step 5.9[2] (same as step 5.1[1](b))

Other changes:

- Removed VY from coversheet and deleted step 5.8[4](e) as fleet procedures no longer apply to VY.
- Reformatted table in section 8 for compliance with EN-AD-101-01, updated the table and deleted VY entries from the table. Updated cross references to section 8 within the body of the procedure.
- Deleted reference to VY commitments from step 5.8[3]

<b>Associated PRHQN #:</b> 2015-00273	<b>Procedure Writer:</b> Ron Schwartz
<b>Contains Proprietary Information:</b> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	

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## 1.0 **PURPOSE**

The Process Control Program (PCP) requires formulas, sampling, analyses, test and determinations to be made to ensure that the processing and packing of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Parts 20, 61 and 71, State Regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste. The scope of a PCP is to assure that radioactive waste will be handled, shipped, and disposed of in a safe manner in accordance with approved site or vendor procedures, whichever is applicable. [GGNS UFSAR, Chapter 16B.1 / TRM – 7.6.3.8 paragraph 1]

- 1.1 The purpose of this document is to provide a description of the solid radioactive waste Process Control Program (PCP) at all the Entergy fleet sites. The PCP describes the methods used for processing, classification and packaging low-level wet radioactive waste into a form acceptable for interim on-site storage, shipping and disposal, in accordance with 10 CFR Part 61 and current disposal site criteria.
- 1.2 To ensure the safe operation of the solid radwaste system, the solid radwaste system will be used in accordance with this Process Control Program to process radioactive wastes to meet interim on-site storage, shipping and burial ground requirements.
- 1.3 This document addresses the process control program in the context of disposal criteria, on-site processing and vendor processing requirements.
- 1.4 The Process Control Program implements the requirements of 10CFR50.36a and General Design Criteria 60 of Appendix A to 10CFR Part 50. The process parameters included in 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.
- 1.5 This document 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.

## 2.0 **REFERENCES**

- [1] EN-QV-104, "Entergy Quality Assurance Program Manual Control"
- [2] Title 49, Code of Federal Regulations
- [3] Title 10, Code of Federal Regulations, Part 20

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- [4] Title 10, Code of Federal Regulations, Part 61
- [5] Title 10, Code of Federal Regulations, Part 71, Appendix H [QAPM, Section A.1.c]
- [6] Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification, 11 May 1983
- [7] Disposal Site Criteria and License
- [8] Waste Processor Acceptance Criteria
- [9] EN-LI-100, "Process Applicability Determination"
- [10] NRC Information and Enforcement Bulletins
  - NRC Information Notice 79-19: Packaging of Low-Level Radioactive Waste for Transport and Burial.
  - NRC Information Notice 80-24: Low-Level Radioactive Waste Burial Criteria.
  - NRC Information Notice 80-32: Clarification of Certain Requirements for Exclusive-Use Shipments of Radioactive Materials.
  - NRC Information Notice 80-32, Rev. 1: Clarification of Certain Requirements for Exclusive-Use Shipments of Radioactive Materials.
  - NRC Information Notice 83-05: Obtaining Approval for Disposing of Very-Low-Level Radioactive Waste - 10CFR Section 20.302.
  - NRC Information Notice 83-10: Clarification of Several Aspects Relating to Use of NRC-Certified Transport Packages.
  - NRC Information Notice 83-33: Non-Representative Sampling of Contaminated Oil.
  - NRC Information Notice 84-50: Clarification of Scope of Quality Assurance Programs for Transport Packages Pursuant to 10CFR 50 Appendix B.
  - NRC Information Notice 84-72: Clarification of Conditions for Waste Shipments Subject to Hydrogen Gas Generation.
  - NRC Information Notice 85-92: Surveys of Wastes Before Disposal from Nuclear Reactor Facilities.
  - NRC Information Notice 86-20: Low-Level Radioactive Waste Scaling Factors, 10CFR 61.
  - NRC Information Notice 86-90: Requests to Dispose of Very Low-Level Radioactive Waste Pursuant 10CFR 20.302

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- NRC Information Notice 87-03: Segregation of Hazardous and Low-Level Radioactive Wastes
  - NRC Information Notice 87-07: Quality Control of On-Site Dewatering/ Solidification Operations by Outside Contractors
- [11] NRC Information and Enforcement Bulletins (continued)
- NRC Information Notice 89-27: Limitations on the Use of Waste Forms and High Integrity Containers for the Disposal of Low-Level Radioactive Waste
  - NRC Information Notice 92-62: Emergency Response Information Requirements for Radioactive Material Shipments
  - NRC Information Notice 92-72: Employee Training and Shipper Registration Requirements for Transporting Radioactive Materials
  - NRC Generic Letter 89-01, "Implementation of Programmatic Controls for Radiological Effluent Technical Specifications in the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of RETS to the Offsite Dose Calculation Manual or to the Process Control Program".
- [12] Nureg-0800 Standard Review Plan Section 11.4 Revision 2, Solid Waste Management Systems.
- [13] NRC Waste Form Technical Position, Revision 1 Jan 24 1991.
- [14] NRC SECY 94-198 Review of Existing Guidance Concerning the Extended Storage of Low-Level Radioactive Waste.
- [15] EPRI TR-106925 Rev-1, Interim On-Site Storage of Low Level Waste: Guidelines for Extended Storage - October 1996
- [16] NRC Branch Technical Position On Concentration Averaging And Encapsulation Jan 17 1995
- [17] Commitment Documents (U-2 and U-3)
- IPN-99-079, "Supplement to Proposed Changes to Technical Specifications Incorporating Recommendations of Generic Letter 89-01 and the Revised 10 CFR Part 20 and 10 CFR Part 50.36a.
  - Appendix B Technical Specifications, Section 4.5 [IP, RECS ODCM Part 1]

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### 3.0 **DEFINITIONS**

- [1] **Batch** – A quantity of waste to be processed having essentially consistent physical and chemical characteristics as determined through past experience or system operation knowledge by the Radwaste Shipping Specialist. A batch could be a waste tank, several waste tanks grouped together or a designated time period such as between outages as with the DAW waste stream. 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).
- [2] **Certificate of Compliance** - Document issued by the USNRC regulating use of a NRC licensed cask or issued by (SCDHEC) South Carolina Department of Health and Environmental Conservation regulating a High Integrity Container.
- [3] **Chelating Agents** - EDTA, DTPA, hydroxy-carboxylic acids, citric acid, carbolic acid and glucinic acid.
- [4] **Compaction** - The process of volume reducing solid waste by applying external pressure.
- [5] **Confirmatory Analysis** - The practice of verifying that gross radioactivity measurements using MCA are reasonably consistent with independent laboratory sample data.
- [6] **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).
- [7] **De-watering** - The removal of water or liquid from a waste form, usually by gravity or pumping.
- [8] **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.
- [9] **Dry Waste** - Radioactive waste which exist primarily in a non-liquid form and includes such items as dry materials, metals, resins, filter media and sludges.
- [10] **Encapsulation** - Encapsulation is a means of providing stability for certain types of waste by surrounding the waste by an appropriate encapsulation media.
- [11] **Gamma-Spectral-Analysis** - Also known as IG, MCA, Ge/Li and gamma spectroscopy.
- [12] **Gross Radioactivity Measurements** - More commonly known as dose to curie conversion for packaged waste characterization and classification.

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- [13] **Homogeneous** - Of the same kind or nature; essentially alike. Most Volumetric waste streams are considered homogeneous for purposes of waste classification.
- [14] **Incineration** – The process of burning a combustible material to reduce its volume and yield an ash residue.
- [15] **Liquid Waste** - Radioactive waste that exist primarily in a liquid form and is contained in other than installed plant systems, to include such items as oil, EHC fluid, and other liquids. This waste is normally processed off-site.
- [16] **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).
- [17] **Measurement of Specific Radionuclides** - More commonly known as direct sample or container sample using MCA data for packaged waste characterization and classification.
- [18] **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).
- [19] **Pregualification 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.
- [20] **Processing** - Changing, modifying, and/or packaging radioactive waste into a form that is acceptable to a disposal facility.
- [21] **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.

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- [22] **Reportable Quantity Radionuclides (RQ)** - Any radionuclide listed in column (1) of Table 2 of 49CFR Part 172.101 which is present in quantities as listed in column (3) of Table 2 of 49CFR Part 172.101.
- [23] **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.
- [24] **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).
- [25] **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 radionuclides listed in Appendix G to 10CFR20 (H-3, C-14, I-129, Tc-99).
  - Greater than or equal to 1 percent of the concentration limits as 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 on 49CFR Part 172.101 Table 2.
- [26] **Solidification** - The conversion of wet waste into a free-standing monolith by the addition of an agent so that the waste meets the stability and free-standing liquid requirements of the disposal site.
- [27] **Special Radionuclides** - The RADMAN computer code term for radionuclides listed in Appendix G to 10CFR20 (i.e., H-3, C-14, I-129 & Tc-99)
- [28] **Stability** – Structural stability per 10CFR61.2, Waste Form Technical Position, and Waste Form Technical Position Revision 1. This can be provided by the waste form, or by placing the waste in a disposal container or structure that provides stability after disposal. Stability requires that the waste form maintain its structural integrity under the expected disposal conditions.




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- [29] **Training** - A systematic program that ensures a person has knowledge of hazardous materials and hazardous materials regulations.
- [30] **Type A Package** - Is the packaging together with its radioactive contents limited to A1 or A2 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.
- [31] **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.
- [32] **Volume Reduction** – any process that reduces the volume of waste. This includes but is not limited to, compaction and incineration.
- [33] **Waste Container** - A vessel of any shape, size, and composition used to contain the waste media.
- [34] **Waste Form** - Waste in a waste container acceptable for disposal at a licensed disposal facility.
- [35] **Waste Stream** - A Plant specific and constant source of waste with a distinct radionuclide content and distribution.
- [36] **Waste Type** – A single packaging configuration and waste form tied to a specific waste stream.

#### 4.0 **RESPONSIBILITIES**

- [1] The **Vice President Operations Support (VPOS)** is responsible for the implementation of this procedure.
- [2] Each site **Senior Nuclear Executive (SNE)** is responsible for ensuring that necessary site staff implements this procedure.
- [3] The **Low Level RadWaste (LLRW) Focus Group** is responsible for evaluating and recommending changes and revisions to this procedure.

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- [4] Each site **RP Department – Radwaste Supervisor / Specialist** (title may vary at the site's respectively) has the overall responsibility for implementing the PCP and is responsible for processing and transportation is tasked with the day-to-day responsibilities for the following:
- Implementing the requirements of this document.
  - Ensuring that radioactive waste is characterized and classified in accordance with 10CFR Part 61.55 and Part 61.56.
  - Ensuring that radioactive waste is characterized and classified in accordance with volume reduction facility and disposal site licenses and other requirements.
  - Designating other approved procedures (if required) to be implemented in the packaging of any specific batch of waste.
  - Providing a designated regulatory point of contact between the Plant and the NRC, volume reduction facility or disposal site.
  - Maintaining records of on-site and off-site waste stream sample analysis and Plant evaluations.
  - Suspending shipments of defectively processed or defectively packaged radioactive wastes from the site when the provisions of this process control program are not satisfied.


## 5.0 **DETAILS**

An isotopic analysis SHALL be performed on every batch for each waste stream so that the waste can be classified in accordance with 10CFR61. The isotopic and curie content of each shipping container SHALL be determined in accordance with 49CFR packaging requirements. The total activity in the container may be determined by either isotopic analysis or by dose-rate-to-curie conversion.

### 5.1. **Precautions and Limitations**

#### [1] **Precautions**

- Radioactive materials SHALL be handled in accordance with applicable radiation protection procedures.
- All radioactive waste owned by Entergy processed on-site **OR** off-site by vendors must be processed or packaged to meet the minimum requirements listed in 10CFR Part 61.56 (a) (1) through (8).

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- (c) If the provisions of the Process Control Program are not satisfied, suspend shipment of the defectively processed or defectively packaged waste from the site. Shipment may be accomplished when the waste is processed / packaged in accordance with the Process Control Program.
- (d) The generation of combustible gases is dependent on the waste form, radioactive concentration and accumulated dose in the waste. Changes to organic inputs (e.g. oil) to waste stream may change biogas generation rates.


[2] Limitations

- (a) Only qualified personnel will characterize OR package radioactive waste OR radioactive materials for transportation or disposal.
- (b) All site personnel that have any involvement with radioactive waste management computer software SHALL be familiar with its functions, operation and maintenance.

## 5.2. Waste Management Practices

[1] Waste processing methods include the following:

- (a) Present and planned practice is NOT to solidify or encapsulate any waste streams.
- (b) Waste being shipped directly for burial in a HIC (High Integrity Container) is dewatered to less than 1 percent by volume prior to shipment.
- (c) Waste being shipped directly for burial in a container other than a HIC is dewatered to less than 0.5 percent by volume prior to shipment.
- (d) IF solidification is required in the future, THEN at least one representative test specimen from at least every 10th batch of each type of radioactive waste will be checked to verify solidification.
  - (1) IF any specimen fails to verify solidification, THEN 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, and a subsequent test verifies solidification. If alternative parameters are determined, the subsequent tests shall be verified using the alternative parameters determined.

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- (2) IF the initial test specimen from a batch of waste fails to verify solidification, THEN provide for the collection and testing of representative test specimens from each consecutive batch of the same type of waste until at least 3 consecutive initial test specimens demonstrates solidification. The process **SHALL** be modified as required to assure solidification of subsequent batches of waste.

[2] Operation and maintenance of dewatering systems and equipment include the following:


- (a) Present and planned practice is to utilize plant personnel supplemented by vendor personnel or contracted vendor personnel, to operate AND maintain dewatering systems and equipment (as needed to meet disposal site requirements).
- (b) All disposal liners are manufactured by and purchased from QA-approved vendors.

[3] 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). Resin, charcoal media, spent filter cartridges AND sludges are typically processed within shields. 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.

### 5.3. Waste Stream Sampling Methods and Frequency

[1] The following general requirements apply to Plant waste stream sampling:

- (a) Treat each waste stream separately for classification purposes.
- (b) Ensure samples are representative of or can be correlated to the final waste form.
- (c) Determine the density for each new waste stream initially or as needed (not applicable for DAW and filters).
- (d) Perform an in-house analysis for gamma-emitting radionuclides for each sample sent to an independent laboratory.
- (e) Periodically perform in-house analysis for gamma emitting radionuclides for comparison to the current data base values for gamma emitters. (The current database is usually based on the most recent independent laboratory results.)
- (f) Resolve any discrepancies between in-house results AND the independent laboratory results for the same or replicate sample as soon as possible.
- (g) Maintain records of on-site and off-site waste stream sample analysis and evaluations.

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- [2] When required, waste stream samples should be analyzed, re-evaluated and if necessary, shipped to a vendor laboratory for additional analysis. The same is true when there is a reason to believe that an equipment or process change has significantly altered the previously determined scaling factors by a factor of 10.

Specific examples include but are not limited to:


- Changes in oxidation reduction methods such as zinc, injection, hydrogen water chemistry,
- Changes in purification methods including media specialization, media distribution, ion/cation ratios,
- Changes in fuel performance criteria including fuel leaks
- Other changes in reactor coolant chemistry.
- Sustained, unexplained, changes in the routinely monitored Beta/Alpha ratios, as determined by Radiation Protection,
- When there is an extended reactor shutdown (> 90 days).
- When there are changes to liquid waste processing, such as bypassing filters, utilizing filters or a change in ion exchange media.
- When there are changes to the waste stream that could change the biogas generation rate.

- [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 RP Department Supervisor / Specialist responsible for processing **AND** shipping 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, **THEN** the RP Department Supervisor / Specialist responsible for processing and shipping **SHALL** determine specific off-site sampling and analysis requirements necessary to properly classify the material.
- [4] Specific sampling methods and data evaluation criteria are detailed in EN-RW-104 for specific waste streams.

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#### 5.4. **Waste Classification**

- [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 ratio-ing 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 sites 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. Second order scaling of transuranics is acceptable when Cs-137 and Ce-144 are not readily measurable.
- [2] General requirements for the determination of total activity and radionuclide concentrations include the following:
- (a) The activity for the waste streams 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 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 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.

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### 5.5. **Quality Control**

- [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.
- [2] Audits and Management Review includes the following:
- (a) Appendix G to 10CFR20 requires conduct of a QC program which must include management review of audits.
  - (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 and assessments are performed and documented by any of the following:
    - Radiation Protection Department
    - Quality Assurance Department
    - Qualified Vendors
  - (d) Certain elements of the Entergy Quality Assurance Program Manual are applied to the Process Control Program. [QAPM, Section A.1.c]

### 5.6. **Dewatering Operations**

- [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.
- [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 (12.95 MBq) per cubic centimeter



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### 5.7. Waste Packaging

Waste in final form will be packaged in accordance with Title 10 and Title 49 of the Code of federal regulations and in accordance with current burial site criteria as is detailed in EN-RW-102.

### 5.8. Administrative Controls

- [1] Information on solid radioactive waste shipped off-site is reported annually to the Nuclear Regulatory Commission in the Annual Radioactive Effluent Release Report as specified by the Offsite Dose Calculation Manual (ODCM) or Technical Specification. [ANO1 Technical Specifications - 5.6.3] [ANO2 Technical Specifications – 6.6.3] [WF3 Technical Specifications – 6.9.18] [GGNS ODCM – 5.6.3.c] [JAF Technical Specifications – 5.6.3] [JAF ODCM 6.2.1] [PLP ODCM, Appendix A – IV. A].
- [2] All changes to the PCP SHALL be documented. All records of reviews performed SHALL be retained as required by the Quality Assurance Program. The documentation of the changes SHALL [GGNS UFSAR, Chapter 16B.1 / TRM – 7.6.3.8 paragraph 2]:
  - (a) Contain sufficient information to support the change with appropriate analyses or evaluations justifying the change.
  - (b) Include a determination that the change will maintain the overall conformance of the solidified waste product (if applicable) to existing requirements of Federal, State or other applicable regulations.
- [3] All changes in the Process Control Program and supporting documentation are included in each site's next Annual Radiological Effluent Release Report to the Nuclear Regulatory Commission. [ANO ODCM - L3.2.1.C] [RBS Technical Requirements 5.5.14.1]
- [4] The changes to EN-RW-105 SHALL become effective upon review and acceptance by the site's General Plant Manager (equivalent title at Palisades is Plant Superintendent) except as listed below: [PLP Technical Specifications 5.5.15]
  - (a) For Grand Gulf Nuclear Station, the changes to RW-105 SHALL be accomplished as specified in Grand Gulf Nuclear Station Technical Requirements Manual (TRM) Section 7.6.3.8. The changes SHALL become effective upon review and acceptance by the On-site Safety Review Committee (OSRC) **AND** the approval of the GGNS Plant General Manager. [GGNS UFSAR, Chapter 16B.1 / TRM – 7.6.3.8 paragraph 2]



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- (b) For River Bend Nuclear Station, the procedure approval along with changes to RW-105 SHALL be accomplished per the River Bend Nuclear Station Technical Requirements, Section 5.5.14.1. The changes SHALL become effective upon review and acceptance by approval from the River Bend Nuclear Station Plant Manager or Radiation Protection Manager. [RBS Technical Requirements – 5.5.14.1, 5.5.14.2 & 5.8.2]
- (c) For Waterford 3, the procedure approval along with changes to RW-105 SHALL be accomplished per Waterford 3 Technical Specifications 6.13.2. The changes SHALL become effective upon review and acceptance by the Waterford 3 General Plant Manager. [WF3 Technical Specifications – 6.13.2.b]
- (d) For James A. FitzPatrick Nuclear Station, the procedure approval along with changes to EN-RW-105 SHALL be accomplished per the James A. FitzPatrick Station Technical Specifications, Section 5.6.3. The changes SHALL become effective upon review and acceptance through approval from the James A. FitzPatrick Nuclear Station On-Site Safety Review Committee. [JAF FSAR 11.3.5, 13.10.1.1]
- (e) For IPEC, Changes to the Process Control Program SHALL become effective after final review and acceptance by the On-Site Safety Review Committee (OSRC).

## 5.9. **Vendor Requirements**

- [1] Vendors performing radwaste services under 10CFR61 and 10CFR71 requirements will be on the Entergy Qualified Supplier's List (QSL). [QAPM, Section A.1.c]
- [2] All radioactive waste owned by Entergy processed off-site by vendors must be processed or packaged to meet the minimum requirements listed in 10CFR Part 61.56 (a) (1) through (8) and any applicable burial site criteria.
- [3] Vendors performing radwaste services on-site are to comply with the following:
  - (a) Dewatering and solidification services SHALL have a NRC-approved Topical Report or other form of certification documenting NRC approval of the processes and associated equipment/containers. [GGNS FSAR 11.4.4.S2, 11.4.2.3AS7]

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- (b) All vendor procedures utilized for performing on-site radwaste processing services (to assure compliance with 10 CFR Parts 20, 61 and 71, State Regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste) will be reviewed per the requirements of EN-LI-100, technically by the applicable site's Radiation Protection organization and only be accepted per the approvals specified in Section 5.8 [4].
- (c) All changes to vendor procedures for ongoing on-site radwaste services will be reviewed technically by the site's Radiation Protection organization and screened per the requirements of EN-LI-100. Significant procedural changes will require the approvals specified in Section 5.8 [4]. During screening, the level of significance for procedural changes on equipment and process parameters may warrant the full 10CFR50.59 documentation and approval process.
- (d) Plant management SHALL review vendor(s) topical reports and test procedures per applicable requirements in Section 5.8.

**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.

- (e) Plant management review will assure that the vendor's operations and requirements are compatible with the responsibilities and operation of the Plant.
- (f) Training requirements and records listed in Section 5.10 also apply to contracted vendors.

**5.10. Miscellaneous**

[1] Special tools and equipment

- (a) 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 specific procedures developed to govern activities described in this document.

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[2] Pre-requisites

(a) Maintenance of Regulatory Material

Ensure that a current set of DOT, NRC, EPA and applicable State regulations, vendor processing facility and disposal site regulations and requirements are maintained at the site and are readily available for reference. The use of web based regulations is acceptable.

(b) 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 requirements of EN-RW-104.

(c) 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.
- Training requirements and documentation also apply to contracted on-site vendors.

**NOTE**

Cyclic training is defined as within three years for DOT, and two years for IATA

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

- Classifies hazardous materials.
- Packages hazardous materials.
- Fills, loads and/or closes packages.
- Marks and labels packages containing hazardous materials.
- Prepares shipping papers for hazardous materials.
- Offers or accepts hazardous materials for transportation.

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- Handles hazardous materials.
  - Marks or placards transport vehicles.
  - Operates transport vehicles.
  - Works in a transportation facility and performs functions in proximity to hazardous materials which are to be transported.
  - Inspects or tests packages.
- (e) Cyclic training is defined as within three years for DOT & within two years for IATA.

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:


- Trainee's name and signature
- Training dates
- Training material or source reference
- Trainer's information

## 6.0 **INTERFACES**

- [1] EN-LI-100, "Process Applicability Determination"
- [2] EN-RW-104, "Scaling Factors"
- [3] EN-QV-104, "Entergy Quality Assurance Program Manual Control"

## 7.0 **RECORDS**

- [1] Documentation of pertinent data required to classify waste and verify solidification will be maintained on each batch of processed waste as required by approved procedures.
- [2] Documentation will also be maintained to ensure that containers, shipping casks, and methods of packaging wastes meet applicable Federal regulations and disposal site criteria. The records of reviews performed and documents associated with these reviews will be maintained as QA records.

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## 8.0 SITE SPECIFIC COMMITMENTS

Site	Document	Commitment Number or Reference	NMM Procedure Section/Step
ANO	ANO ODCM	L3.2.1.C	5.8 [3]
ANO	ANO1 Technical Specifications	5.6.3	5.8 [1]
ANO	ANO2 Technical Specifications	6.6.3	5.8 [1]
RBS	RBS Technical Requirements	5.5.14	*
RBS	RBS Technical Requirements	5.5.14.1	5.8 [3] 5.8 [4] (b)
RBS	RBS Technical Requirements	5.5.14.2	5.8 [4] (b)
RBS	RBS Technical Requirements	5.8.2	5.8 [4] (b)
WF3	WF3 Technical Specifications	1.22	*
WF3	WF3 Technical Specifications	6.9.18	5.8 [1]
WF3	WF3 Technical Specifications	6.13.2.b	5.8 [4] (c)
JAF	JAF ODCM	6.2.1	5.8 [1]
JAF	JAF Technical Specifications	5.6.3	5.8 [1], 5.8 [4](d)
JAF	JAF FSAR	11.3.5, 13.10.1	5.8 [4](d)
WF3	11759 – NRC IN 79-19	All	*
GGNS	GGNS UFSAR, Chapter 16B.1 / TRM	7.6.3.8 paragraph 1	1.0
GGNS	GGNS ODCM	5.6.3.c	5.8 [1]
GGNS	GGNS FSAR	11.4.5.S2	5.9 [3](a)
GGNS	GGNS FSAR	11.4.2.3AS7	5.9 [3](a)
IPEC	IPN-99-079	All	*
IPEC	Appendix B Technical Specifications	Section 4.5, RECS ODCM Part 1	*
PLP	PLP Technical Specifications	5.5.15	5.8 [4]
PLP	PLP ODCM	Appendix A – IV. A	5.8 [1]
PNPS	NRC Letter 1.98.091	All	*
PNPS	NRC Letter 1.88.078	All	*
All	QAPM	Section A.1.c	*

\* Covered by directive as a whole or by various paragraphs of the directive.

## 9.0 ATTACHMENTS

None