

ENCLOSURE 4

0520025, PROCESS CONTROL PROGRAM, REVISION 16  
(11 PAGES)

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**ST. LUCIE PLANT**  
**ADMINISTRATIVE PROCEDURE**  
 NON-SAFETY RELATED  
**REFERENCE USE**

Procedure No.  
**0520025**  
 Current Revision No.  
**16**

Title: **PROCESS CONTROL PROGRAM**

Responsible Department: **RADIATION PROTECTION**

**REVISION SUMMARY:**

**Revision 16** - Incorporated PCR 2064263 to remove procedures listed in Step 3.2.1.B and Step 3.2.1.C since they are no longer used at PSL. They are used as reference material only and identified in Step 6.2 and Step 6.3. (Author: J. Simon)

**Revision 15** - Incorporated PCR 2042572 to update references that have been superseded or no longer used. (Author: J. Simon)

**Revision 14** - Incorporated PCR 1722646 to change HPS to RPM and FRG to ORG, to remove reference to deleted T.S 6.10.2q, to replace HP-40 with RP-AA-108-1002 radioactive shipment procedure, to remove Barnwell facility, to remove container type from effluent report not required by Reg 1.21 and to add as applicable for solidification agent. (Author: J. Simon)

**Revision 13C** - Incorporated PCR 09-3004 for CR 2007-21553. Several steps reference the old FRG terminology and need to be updated to reflect ORG instead. (Author: Nathan Rightmer)

**Revision 13B** - Incorporated PCR 05-3003 for CR 2005-18614 to add Level of Use to procedure cover page. (Helga Baranowsky, 09/29/05)

**Revision 13A** - Incorporated PCR 03-3437 to change delegation of procedure from Safety Related to Non-Safety Related. (Bonnie Wooldridge, 12/04/03)

**Revision 13** - Made changes to References Section. (Bruce Somers, 07/20/99)

| Revision | Approved By | Approval Date | UNIT #    |
|----------|-------------|---------------|-----------|
| 0        | J.H. Barrow | 12/28/82      | DATE      |
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**1.0 TITLE**

PROCESS CONTROL PROGRAM

**2.0 REVIEW AND APPROVAL**

See cover page

**3.0 SCOPE**

**3.1 Purpose**

The St. Lucie Plant Process Control Program (PCP) implements the requirements of 10 CFR Part 50.36a and General Design Criterion 60 of Appendix A to 10 CFR 50. Specifically, the PCP applies to waste form classification of all radioactive waste destined for land burial in accordance with 10 CFR 20.2006. In addition, the specific requirements are provided for dewatering of bead resins for disposal and for vendor supplied processes for solidification, encapsulation or absorption of liquid or wet solid radioactive wastes when performed on site and under the licenses issued to the St. Lucie Plant by the Nuclear Regulatory Commission.

Radioactive waste that is shipped to a licensed radioactive waste disposal facility for disposal, the St. Lucie Plant is responsible to meet all of the license conditions, including waste form and waste classification requirements of the disposal sites radioactive material license.

Radioactive waste that is shipped to a radioactive waste processor for further processing of the waste prior to disposal, the St Lucie Plant is responsible to meet all of the license conditions of the radioactive waste processor. In this case, however, it is the responsibility of the radioactive waste processor to meet the requirements of the radioactive waste disposal site license for the radioactive waste shipped to the disposal site.

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### 3.2 Discussion

1. The PCP contains provisions to assure that dewatering of bead resins results in a waste form with characteristics that meet the requirements of 10 CFR 61 as implemented by 10 CFR 20 and of the low level radioactive waste disposal site. The PCP includes in addition to this procedure the following related procedures:
  - A. St. Lucie Plant Health Physics Procedure No. HP-49, "Dewatering Radioactive Bead Resins."
  - B. CS-OP-PR-008-161049 Energy Solutions Self-Engaging Dewatering System Fill Head at St Lucie.
2. Vendor supplied processes for solidification, encapsulation or absorption of liquid radioactive waste are conducted in accordance with a vendor PCP and appropriate operating procedures specific to the process to be used and are reviewed and accepted by the On-Site Review Group (ORG) and approved by the Plant General Manager. Once approved for use at the St. Lucie Plant, changes to the vendor's process control program must be documented in accordance with Technical Specification 6.13 and as shown in Section 4.4. and be reviewed and accepted by the ORG and approved by the Plant General Manager prior to continued use at the St. Lucie Plant.
3. All radioactive waste shipped for land burial must meet the requirements of 10 CFR 20.2006 regarding waste form classification and packaging. This is implemented through procedure HP-47, "Classification of Radioactive Waste Material for Land Disposal."

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### 3.3 Authority

The authority and responsibility to perform the requirements of this procedure come from 10 CFR 20, 10 CFR 61, St. Lucie Plant Unit 1 Technical Specifications, St. Lucie Plant Unit 2 Technical Specifications and from disposal site criteria.

### 3.4 Definitions

1. Absorption - The process of absorbing liquid radioactive waste materials onto an absorbent material.
2. Dewatering - The process of removing free standing water from a final disposal package which contains radioactive bead resins to meet the applicable requirements of 10 CFR 61 and of the disposal site license and can include drying to a relative humidity end point.
3. Encapsulation - The process of enclosing radioactive waste material within a disposal site approved stabilization media, such that the final product meets the applicable requirements of 10 CFR 61 and of the disposal site license.
4. Free Standing Water - Liquid which is not retained by the waste form.
5. Solidification - The process of solidifying liquid radioactive waste material in a disposal site approved stabilization media, such that the final product meets the applicable requirements of 10 CFR 61 and of the disposal site license.
6. The Process Control Program (PCP) contains the current formulas, sampling, analyses, test and determinations to be made to ensure that processing and packaging 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.
7. Visual Inspection - The direct observation of the bead resins during the entire period of resin transfer as they are packaged in the final disposal container.
8. Waste Form Classification - Classification of radioactive waste as per 10 CFR 61.55 and 10 CFR 61.56.

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#### 4.0 PRECAUTIONS

4.1 Process Control Procedures used for the dewatering of radioactive bead resins that establish the conditions that must be met shall be based on full scale testing. This is to provide reasonable assurance that the dewatering drying of the resin and disposal container will result in volumes of free standing water, at the time of disposal, within the limits of 10 CFR, Part 61 as implemented by 10 CFR 20 and of the low level radioactive waste disposal site.

4.2 Vendor supplied solidification, encapsulation and absorption processes performed on site shall be based on process control procedures, operating procedures and full scale testing that ensures that the final waste form will meet the applicable requirements of 10 CFR 61 and of the disposal site license. Evidence that the vendor's process control program will meet the applicable waste form requirements of 10 CFR 61 and the disposal site license may be in the form of topical reports, NRC approved documentation, vendor test reports, inspection reports and/or other documentation as appropriate for the specific waste form requirements that must be met (e.g., Class A unstable, Class A stable, Class B or Class C). Procedures which are to be used must be controlled per the vendor's QA program.

4.3 All changes to the St. Lucie Plant PCP shall become effective after review and acceptance by the ORG and approval of the Plant General Manager.

4.4 All changes to the St. Lucie Plant PCP shall be documented in accordance with Technical Specification 6.13. This documentation shall contain the following:

1. Sufficient information to support the change together with the appropriate analyses or evaluations justifying the change(s) and
2. A determination that the change will maintain the overall conformance of the solidified or dewatered waste product to existing requirements of Federal, State or other applicable regulations.

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**5.0 RESPONSIBILITES**

- 5.1 It is the responsibility of the Plant General Manager to assure that all necessary procedures, equipment and support are provided to properly implement the PCP.
- 5.2 It is the responsibility of the Radiation Protection Manager (RPM) or his designee to assure that the radioactive bead resin will be dewatered in accordance with the PCP.
- 5.3 It is the responsibility of the RPM or his designee to assure that radioactive waste material is classified in accordance with the PCP.
- 5.4 FPL Dewatering equipment shall be operated by or under the direction of FPL personnel.

**6.0 REFERENCES**

**NOTE**

One or more of the following symbols may be used in this procedure:

- § Indicates a Regulatory commitment made by Technical Specifications, Condition of License, Audit, LER, Bulletin, Operating Experience, License Renewal, etc. and shall NOT be revised without the required Focus review and appropriate approval.
- ¶ Indicates a management directive, vendor recommendation, plant practice or other non-regulatory commitment that should NOT be revised without consultation with the plant staff.
- Ψ Indicates a step that requires a sign off on an attachment.

- 6.1 Bead Resin/Activated Carbon Dewatering Procedure for CNS 14-215 or smaller liners - FO-OP-023.
- 6.2 Test Instruction for Dewatering Conical Bottom Resin Liners and Atmospheric Demineralizers - Zero FSW - Project 11118-A (CNS).
- 6.3 Test Report for Dewatering Conical Bottom Resin Liners and Atmospheric Demineralizers - Zero Water - Project 11118-A (CNS).
- 6.4 HP-47, Classification of Radioactive Waste Material for Land Disposal.
- 6.5 HP-49, Dewatering Radioactive Bead Resins.
- 6.6 CS-OP-PR-008-161049 Energy Solutions Self-Engaging Dewatering System Fill Head at St Lucie.



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**6.7** Nuclear Packaging, Inc., Proprietary Topical Report No. TP-02-P-A covering Nuclear Packaging, Inc. Dewatering System.

**6.8** RP-AA-108-1002, Shipment of Radioactive Materials.

**6.9** HP-48, Activity Determination for Radioactive Material Shipments.

**7.0** RECORDS AND NOTIFICATIONS

**7.1** Records shall be as per St. Lucie Plant Health Physics Procedure No. HP-49, "Dewatering Radioactive Bead Resins."

**7.2** Records of vendor supplied solidification, encapsulation or absorption processes for liquid radioactive wastes.

**7.3** Annual Radioactive Effluent Release Reports.

**7.4** Notifications:

- 1.** If it is suspected that the free standing water requirements may not be met for any container of radioactive bead resin shipped to a disposal site, notify the Plant General Manager and the RPM.
- 2.** If the process control procedures have not been followed or if free standing water may be present in the final shipping container of bead resin in amounts greater than allowed by regulations, notify the RPM or his designee.

**7.5** Records:

- 1.** Records of reviews performed for changes shall be retained as required and be maintained in the plant files in accordance with RM-AA-100-1000, "Processing Quality Assurance Records."

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## 8.0 INSTRUCTIONS

### 8.1 Dewatered radioactive bead resins:

1. Disposal of dewatered radioactive bead resins is limited to the containers for which full scale dewatering tests have been conducted.
2. Dewater the container as per St. Lucie Health Physics Procedure No. HP-49, Dewatering of Radioactive Bead Resins and/or CS-OP-PR-008-161049, Energy Solutions Self-Engaging Dewatering System Fill Head at St Lucie.
3. Only containers compatible with FPL owned or leased resin transfer/dewatering equipment may be used.
4. Radioactive bead resins shall be dewatered, as appropriate, to meet shipping and transportation requirements during transit and disposal site requirements when received at the disposal site.
  - A. With dewatering not meeting disposal site, shipping and transportation requirements, suspend shipment of the inadequately dewatered bead resin and correct the PCP, the applicable procedures(s) and/or the dewatering system as necessary to prevent recurrence.
  - B. With dewatering not performed in accordance with the PCP:
    - (1) if the dewatered bead resin has not already been shipped for disposal, verify each container to ensure that it meets burial ground, shipping and transportation requirements and
    - (2) take appropriate administrative action to prevent recurrence.
5. Prior to disposal, each container of radioactive bead resins shall be tested for free standing liquids to assure that it meets shipping, transportation and disposal site requirements.
6. Close the container as per the manufacturer's instructions.

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**8.2** Solidification, encapsulation or absorption of radioactive waste materials shall be performed in accordance with FPL approved vendor procedures. These procedures shall provide for the following:

1. Vendor's procedures, check sheets, checklists, etc., shall be FPL site specific and reviewed and accepted by the ORG and approved by Plant General Manager prior to implementation.
2. These procedures shall include Hold Points for FPL-PSL verification of crucial steps within the process. These steps may include, but are not limited to the following:
  - A. Sampling of the waste stream
  - B. Review and acceptance of waste analyses
  - C. Verification of process test specimens
  - D. Verification of waste additions
  - E. Verification of chemical additions
  - F. Verification of mixing
  - G. Verification of final waste form and
  - H. Verification of free standing liquid
3. These procedures shall also include steps for testing the final waste form to ensure that all burial site and NRC waste form characteristics requirements are met.

**8.3** All radioactive waste material packaged and destined for land disposal shall conform to the requirements of 10 CFR 20.2006 as implemented by procedure HP-47. If waste form classification exceeds Class C or packaging does not meet the requirements of the waste form class, the RPM shall be notified and shipment shall not be made.

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**8.4** The annual Radioactive Effluent Release Reports shall include:

1. The following information for each class of solid waste (as defined by 10 CFR Part 61) shipped off site during the report period:
  - A. Volume
  - B. Total curie quantity (specify whether determined by measurement or estimate)
  - C. Principal radionuclides (specify whether determined by measurement or estimate)
  - D. Type of waste (e.g., dewatered spent resin, compacted dry waste, evaporator bottoms)
  - E. Type of container (e.g. LSA, Type A, Type B, Large Quantity) and
  - F. Solidification agent or absorbent (e.g., cement, bitumen, vinyl chloride) as applicable.
  
2. The following information for major changes to the solid radioactive waste system:
  - A. A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR 50.59;
  - B. Sufficient detailed information to totally support the reason for the change with benefit of additional or supplemental information;
  - C. A detailed description of the equipment, components and processes involved and the interfaces with other plant systems;
  - D. An evaluation of the change which shows the predicted quantity of solid waste that differs from those previously predicted and in the license application and amendments thereto;
  - E. A comparison of the predicted releases of radioactive materials in solid waste to the actual releases for the period prior to when the changes are to be made;
  - F. An estimate of the exposure to plant operating personnel as a result of the change;
  - G. Documentation of the fact that the change was reviewed and found acceptable by the ORG.