

PROCESS CONTROL PROGRAM  
(PCP)

WATTS BAR NUCLEAR PLANT

REVISION 0

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## WATTS BAR NUCLEAR PLANT

### PROCESS CONTROL PROGRAM (PCP) DESCRIPTION

#### REQUIREMENTS FOR PROCESSING OF RADIOACTIVE LIQUIDS AND WET SOLIDS

##### A. Introduction

A large portion of the radioactive waste produced in a nuclear power station is in a form which is either liquid (e.g. oil, oily sludge, EHC fluid, glycol) or in a wet solid form (e.g. resins, evaporator bottoms, filter cartridges) and requires processing to obtain an acceptable, solid form for disposal. Some of this waste may be sent to a licensed offsite vendor for volume reduction or other preparation for disposal. Radwaste processing activities at Watts Bar are coordinated with the Site Radiological Control to ensure personnel exposures are kept ALARA.

Radioactive wet solids (filter cartridges, evaporator bottoms and resins) are processed by dewatering, vitrification or solidification to assure there is no free-standing water. Dewatering is performed onsite by a qualified contractor. Resins are dewatered in steel liners or High Integrity Containers as necessary, according to Contractor's procedures. Resins may also be processed offsite by vitrification at a licensed facility, or they may be dried and used as loose fill material in packages of supercompacted waste. If the Contractor's PCP Topical Report for dewatering, solidification or vitrification has been approved by the U. S. Nuclear Regulatory Commission (NRC), the approved report is justification to ensure compliance with 10CFR20, 10CFR61, and 10CFR71 as required by WBN Technical Specifications. If the NRC has not approved the Contractor's PCP Topical Report, then the Contractor's equipment and procedures are to be reviewed and approved according to Site procedures to ensure adequate compliance with 10CFR20, 10CFR61, and 10CFR71.

Radioactive liquids (e.g. oil, oily sludges, EHC fluid, glycol) may be shipped offsite for volume reduction by incineration or absorbed and incinerated at a licensed facility. Alternately, radioactive liquids and wet solids may be solidified prior to disposal. Solidification may be performed onsite by a contractor utilizing a mobile solidification system or offsite at a licensed vendor facility. If the Contractor's PCP Topical Report for solidification has been approved by the NRC, the approved report is justification to ensure compliance with 10CFR20, 10CFR61, and 10CFR71 as required by WBN Technical Specifications. If the NRC has not approved the Contractor's PCP Topical Report, then the Contractor's equipment and procedures are to be reviewed and approved according to Site procedures to ensure adequate compliance with 10CFR20, 10CFR61, and 10CFR71.

If incineration, solidification or vitrification is to be performed offsite at a licensed facility, the waste will be packaged and shipped in accordance with the requirements in 49CFR. The processing facility will take title to the waste and certify that it has been properly packaged, incinerated, solidified or vitrified prior to disposal.

## B. Administrative Controls

Compliance with 49CFR, 10CFR20, 10CFR61, 10CFR71, state and disposal site criteria is assured by adherence to approved procedures and instructions. Adherence to WBN and contractor procedures will be required for all activities related to processing of radioactive waste for disposal.

Contractor procedures for onsite processing will be reviewed and approved in a manner consistent with Plant procedures, to ensure compliance with the applicable portions of the PCP. Changes to Contractor's procedures will be reviewed for approval.

Documentation of pertinent data required to classify waste will be maintained on each batch of processed waste as required by approved procedures. Documentation will also be maintained to ensure that containers, shipping casks, and methods of packaging wastes meet applicable Federal regulations and disposal site criteria. These documents will be maintained as QA records.

## C. Waste Streams

WBN has the following radwaste streams:

- Chemical and volume control resin, boron recovery resin, and spent fuel pool clean-up resin.
- Chemical and volume control filters, seal injection filters, boron recovery filters and spent fuel pool clean-up filters.
- Condensate demineralizer polisher resins.
- Condensate demineralizer high crud filter.
- Mobile demineralizer resin.
- Condensate demineralizer waste evaporator bottoms.
- Waste oil.

Other waste streams will be designated as conditions warrant. Occasional limited volumes of other waste may also be processed, including but not limited to, such liquids as EHC fluid and glycol.

## D. Conditioning of Waste and Sampling for Verification of Solidification

A verification of the solidification of liquid radwastes must be performed on at least every tenth container in a batch of waste. However, if trends indicate the possibility of changing parameters which may have an effect on the methods and materials used to produce a monolithic solid with no free-standing liquid, then more frequent sampling may be required. If the initial sample fails to verify solidification, samples from consecutive containers must be obtained until three consecutive samples produce a monolithic solid.

### *NOTE:*

*A Batch is identified as an isolated quantity of feed waste to be processed having constant physical and chemical characteristics; a quantity of material that is determined to be a homogenous mixture for purposes of producing stable, solidified billets for disposal as radioactive waste.*

D. Conditioning of Waste and Sampling for Verification of Solidification  
continued

*EXAMPLE:*

*The contents of a waste holding/storage/mixing tank that has been isolated (so that additional waste cannot be introduced) would constitute a batch.*

Verification of solidification shall be performed as follows:

- a. Three test samples will be taken from the batch. The normal sample volume as specified in approved procedures will be used unless radiological conditions necessitate a smaller volume.
- b. The solidifying agents will be added to the test samples in different proportions.
- c. The test samples will be allowed to set or cure.
- d. After curing, the proportions of the solidification agents which produced the maximum practical compressive strengths shall be used.

*NOTE:*

*The sample with the highest compressive strength does not have to be used, but the objective is not simply to achieve the minimum acceptable compressive strength.*

- e. If none of the samples are found to be satisfactory, the test shall be repeated until an acceptable solidified billet with no free-standing liquid is obtained.

For batches of miscellaneous wastes, a verification of solidification analysis will be performed as specified in steps "a" through "e" above.

If a contractor is performing solidification services, then the contractor will specify the chemical analysis requirements and the acceptable ranges for the physical and chemical characteristics of the waste being processed according to contractor's procedures. The contractor's procedures shall address corrective actions to be taken if samples fail to verify solidification or the absence of free-standing liquids.

The proportions of the solidification agents used for the test batch producing the maximum practical compressive strengths for the verification of solidification shall be used for subsequent batches of the same waste stream.

E. Sampling for Verification of Curie Content

An isotopic analysis shall be performed on at least every tenth container in a batch of each waste stream so that the waste can be classified in accordance with 10CFR61. However, more frequent analysis may be performed if deemed necessary by the Radwaste manager.

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.