

ENCLOSURE 3

PROCESS CONTROL PROGRAM

8011180365

H. B. ROBINSON UNIT 2  
PROCESS CONTROL PROGRAM  
FOR SOLIDIFICATION OF CERTAIN WET WASTES

I. PROGRAM OBJECTIVES

This manual describes the process control program implemented at H. B. Robinson Unit 2 to assure that certain wet wastes are sufficiently converted to solids to qualify for solid radioactive waste disposal at the waste disposal facility. This manual also describes the test specimen program used to verify on a continuing basis that the solidification product conforms to the salient characteristics of a freestanding solid containing less than one gallon of free liquid per packaged unit or 0.5% V/V free liquid per packaged unit whichever is smaller.

II. THE SOLIDIFICATION PROCESS

A. The Facility

Waste solidification is accomplished at the drumming station in the drumming room located on the second floor at the north end of the Unit 2 Auxiliary Building.

B. The Process

The solidification process applied at the H. B. Robinson Plant utilizes concentrated radioactive liquids to produce a slow hydration of cement and forms a freestanding solid that conforms to the Program Objectives. The process is controlled to ensure proper solidification by the use of operating procedures. Sampling and evaluation of every tenth solidification batch determines the quality of the product.

### III. THE SOLIDIFICATION PROCEDURE

The solidification procedure is a simplified manual operation performed in the radwaste drumming room.<sup>1</sup>

1. Empty 55-gallon drums are positioned at the appropriate drumming stations to receive the liquid waste.
2. Each drum is filled with waste liquid to no more than one-half its capacity or about midway between the drum rungs.
3. Seven (7) 96 lb bags of dry concrete are stirred into each drum.
4. When the mixture appears to be a homogeneous, it is allowed to cure for at least 24 hours.
5. At the end of the 24-hour period, the drum is opened and visually inspected for freestanding liquids.
6. Once the product is acceptable, the drum is capped, sealed, surveyed, and appropriately labeled for transport.
7. Unacceptable products are treated with additional concrete cured and reinspected to ensure solidification.

---

<sup>1</sup>"Drumming of Evaporator Bottoms, Compacting Trash and Dewatering Spent Resins," HP-33, H. B. Robinson Steam Electric Plant Unit No. 2, Plant Operating Manual, Volume 8, Appendix I, December, 1979.

#### IV.

#### FORMULATION OF SOLIDIFICATION

The formulation of the liquid wastes and concrete are periodically evaluated to identify any unique chemical interferences as might degrade the solidification process. Such formulation is accomplished when it is indicated by the incidence of solidification failures observed in the batch testing.

##### Process Formulation

Verification of the process formula will be accomplished by mixing aliquots of liquid wastes and cement in convenient "beaker" size volumes in the laboratory. The ratio of waste weight to cement weight in the test is to be identical to the ratio applied in the process. The mix will be allowed to set for 24 hours and then be inspected for free liquid, voids, uniformity, and solidification. The one verification test shall be performed for every 10 batches or "runs" of the solidification process. If the test fails to meet solidification standards, detailed tests will be conducted to determine the parameter requiring modification; such as, pH of liquid, chemical makeup of liquid, method of mixing, and temperature of materials. The results of these tests will be appropriately documented to provide overall guidance on the acceptable operational range of parameters involved in the process.

#### V.

##### Solidification by Outside Services

Solidification of certain wet wastes may also be accomplished by contracted services (i.e., dewatering of resins) in which the solidification process will be one that meets the "Program Objectives" of this manual but may differ in methods and/or procedures. The Plant Nuclear Safety Committee (PNSC) will review the contractor's process control program with respect to its adequacy in ensuring the "Program Objectives" of this manual are met.