PROCESS CONTROL PROGRAM FOR LIQUIDS

AND WET RADIOACTIVE MATERIAL

PRCP-B

Duane Arnold Energy Center

Iowa Electric Light and Power Company

1-30-86 Radwaste Copredinator Approved by: Date Approved by: <u>1-31-86</u> Date Reviewed by: <u>2-4-86</u> Date Chairmar ttee Approved by: 2-12-86 Plant Superintendent-Nuclear Date

01/22/86 Rev. 0

1

8708280351

PDR

INTRODUCTION

This Process Control Program (PRCP) describes the solidification, absorption and/or stabilization of liquids and wet waste materials produced at the DAEC. These wastes, regardless of their classification, are processed to assure that the final product is acceptable for transportation and will meet the disposal site license conditions.

Liquid wastes consist of contaminated aqueous solutions, oils, neutralized acids, solvents, sludges, antifreeze and other liquids all of which may be mixed with one another or in pure form. Wet material wastes may consist of mops, rags, anti-contamination clothing, machine turnings and other material or equipment which may contain sufficient residual liquid to warrant special processing.

VENDOR

The DAEC's Radwaste Group normally processes all waste; however, a vendor may be utilized to process large volume quantities of liquids or liquids with special containment characteristics. Should a contract vendor be utilized to process and package the waste on site in the future a vendor's topical report shall be required. The vendor's topical report will be reviewed to assure that they are compatible with plant requirements. If the vendor has an approved typical report, it shall be referenced in DAEC's PRCP. If the vendor does not have an approved topical report, the vendor's topical report will be included in the DAEC PRCP by reference and submitted to the NRC for review and approval.

SYSTEM DESCRIPTION

The liquids and wet waste materials processing systems are composed of an approved absorption or solidifying agent, 17H 55 gallon drums or metal LSA boxes, transfer pumps and mixing equipment if required.

Liquids waste which is to be absorbed will require the use of equipment such as a liquid transfer pump and volume measuring containers. In addition, mixing equipment, consisting of a mortar mixing trough and/or a motor driven one yard concrete mixer, is used to assure that the absorbent is well blended with the liquid. Absorbed wastes are blended with the absorbent and then transferred to a shipping container.

Liquid waste which is to be solidified will also require the use of a transfer pump and a volume measuring device or container. Liquids are mixed with the solidifying media inside the shipping drum. Aqueous wastes generally do not require the use of mixing equipment, however, oils and neutralized acids will require a one-half inch electric motor equipped with a stirring rod. Figure 1 illustrates the various liquid waste package systems typically used at the DAEC.

OPERATION

Liquids to be absorbed are inspected for the quality of the material prior to absorption and sampled to determine the radioactivity. An isotopic analysis is also performed. A 17H 55 gallon shipping drum is prepared by placing a layer of absorbent in the bottom, then two plastic bag liners and layer of absorbent in the bottom of the liner. The shipping drum is then positioned inside the controlled area adjacent to the mortar mixing trough. A measured volume of the liquid, usually twelve to fifteen

> 01/22/86 Rev.0

gallons, is mixed with an absorbent in either the concrete mixer or the mortar mixing trough until a reasonably dry mixture is achieved. The absorbed mixture is then transferred into the bag liner, on top of the absorbent layer, and topped off with another layer of absorbent. The layers of dry absorbent on the bottom and top of the absorbed liquids assure that the container meets the DOT required absorbent ratio. The drum lid is lightly secured and the drum inverted for the 24 hours and then inspected for free standing liquid.

Liquid wastes to be solidified are also inspected for quality and sampled for radioactivity. A 17H 55 gallon shipping drum is placed inside the controlled area, adjacent to the container of contaminated liquid, and the liquid to be solidified is pumped into the new drum. The solidifying media is added and the mixture stirred if necessary. The drum is allowed to stand overnight and inspected 24 hours later for free standing liquid. It is not necessary to invert the solidified drum because the solidified matrix is heavier than the liquid hence any free liquid will be forced to the surface.

Wet trash and other material which cannot be dried are packaged in a 55 gallon drum or a metal LSA box for shipment. The LSA box is prepared by placing approximately one inch of absorbent and then a plastic liner into the box and then a one inch layer of absorbent in the liner. The wet trash is then placed into the box by layering approximately 12" of material and covering with approximately one inch of absorbent until the waste is about two inches from the top of the box. The liner is sealed and the box lid secured. A free liquid inspection is performed after 24 hours by removal of the bottom drain plug in the LSA Box. The 55 gallon drum is prepared by

placing approximately four inches of absorbent and then two liners into the drum and then about two inches of absorbent into the liner. The wet trash is placed in the drum by layering approximately six inches of material and covering with about two inches of absorbent until the level is two inches below the top of the drum. The liners are sealed and the drum lid secured. The drum is stored upside-down for at least 24 hours and then inspected for free standing liquid.

Essential Waste Characteristics and Verification

The requisite characteristics of the radioactive waste addressed by this Process Control Program are stated in 10 CFR Part 61.56.

The wastes subject to the process control program are from sources within the DAEC that are well characterized and generally recognized as meeting the essential qualities of m art 61.56(a), other than (a)(3). By knowing the source and kind of each of the subject wastes, IELP is able to ensure that the qualities of the wastes continue to meet the requirements of Part 61.56(a), other than (a)(3), and are compatible with the stabilizing media and the container itself.

10 CFR Part 61.56 (b) includes provisions for stability of Class B and C radioactive waste after its disposal. Only Class A waste forms are covered by this PCP hence Part 61.56(b) is not applicable. 10 CFR Parts 61.56 (a)(3) require as little free-standing and noncorrosive liquid as is reasonably achievable, and no more than 1% of the volume. Iowa Electric intends to accomplish this by the processes as described herein and to perform surveillance to assure that it has been done. For a given type of waste, the Radwaste Handling Procedures require an inspection for free liquids 24 hours after packaging and corrective action as necessary.

01/22/86 Rev. 0

Quality Assurance

Control of the absorption and solidification processes is maintained by conducting these operations according to written procedures addressing packaging of contaminated liquids and wet or oily trash. Procedures also identify requirements for container control, handling and inspection, handling and closure of metal drums, handling and closure of metal LSA boxes, and requirements for transportation of waste to the various authorized disposal site(s).

An extensive quality control audit program with appropriate hold and witness points is included in the Radwaste Handling Procedures.

Administration

The Radiation Protection Department maintains procedures which will ensure that all applicable requirements are met prior to shipment of radioactive waste. In the event a vendor's service is required, IELP will review applicable vendor's operating procedures before authorizing a vendor to process radioactive waste. The Radwaste Group of the Radiation Protection Department is responsible for ensuring compliance with the PCP, Vendor oversight, and for record keeping.

At least once every 24 months, IELP will audit the Radwaste Process Control Program and operating procedures that implement it (in accordance with Technical Specification 6.5.2.8.j.) Any change to the Process Control Program will be made in accordance with Technical Specification 6.15, approved by the Plant Superintendent-Nuclear, reviewed by the Operations Committee, and submitted to the NRC in the next Semi-Annual Radioactive Material Release Report after the change is made.

> 01/22/86 Rev. 0

6

FOR INFORMATION

Training

Before an IELP or a vendor employee performs a packaging procedure that is subject to this PRCP, they must have received relevant training, and Iowa Electric must have documented confirmation of the training.

References:

1. DAEC Radwaste Handling Procedures

7

01/22/86 Rev. 0



ABSORBED WET WASTE



ABSORBED LIQUID



SOLIDIFIED LIQUID

FIGURE 1

8

01/22/86 Rev. 0