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CRITICAL MASS CONTROL SPECIFICATION

HOOD 7-A

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CRITICAL MASS CONTROL SPECIFICATIONSHOOD 7-A

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CRITICAL MASS CONTROL SPECIFICATIONS

HOOD 7-A

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I. INTRODUCTION

Hood 7-A will be used to handle filtrate and miscellaneous aqueous waste streams from the RMC button line. This document defines the critical mass control specifications for hood 7-A.

II. DISCUSSION

Nuclear safety in hood 7-A depends almost entirely on controlling the mass and geometry of the plutonium compounds not confined by the processing equipment. Generally, the processing vessels and associated piping are designed and arranged in the hood to be critically safe at full operating capacity. This safety is not assured, however, if plutonium masses outside of the equipment exceed certain proportions of geometry and mass. For those cases where always safe geometry confinement cannot be assured, administrative controls are established.

Of particular concern are the accumulations of plutonium compounds on the floor areas from spills and leaks during equipment operation and maintenance. These plutonium compound build-ups not only influence the criticality of other nearby plutonium masses, but are, themselves, acted upon by neutron sources in the vicinity.

III. SPECIFICATIONS

A. Filtrate Composition

Filtrate and miscellaneous aqueous waste streams received in the hood 7-A filtrate kill tank (FKT) from hood 7-C will be limited as follows:

Plutonium concentration:	250 g/l (maximum)
Excess free HNO_3 :	1.3 mol/l (minimum)
Pu^{240} concentration:	3% * (minimum)

* Under normal HAPO pile operations, this would correspond to about 400 MWD/T (minimum).

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B. Plutonium Compounds Inside of Process Equipment

	<u>Solution Concentration Limit</u>	<u>Mass Limit</u>
1. Filtrate kill tank (FKT) and filtrate catch tank (FCT)	250 g Pu/l	5500 g Pu
2. Filtrate storage tank (FST)	250 g Pu/l	5500 g Pu
3. Prereduction tank (PRT)	250 g Pu/l	5500 g Pu
4. Transfer head tank (THT)	250 g Pu/l	5500 g Pu
5. Filtrate filters	250 g Pu/l	----

C. Plutonium Compounds Outside of Processing Equipment

Solutions containing plutonium, which spill to the floor and drain to the sump, will be limited to a depth of 1/2 inch maximum above the top of the sump. Of this 1/2 inch, 1/8 inch may be solids.

Since the quantities of plutonium solutions or slurries which accumulate on the floor cannot be accurately determined, the primary means of control must be frequent observations and clean-up of accumulations. Safety will be enhanced through good housekeeping.

D. Clean-Up Specifications

Flushing of the hood with liquid is only permitted after the plutonium solutions and any solids have been removed from the inside of the processing equipment. When flushing the hood, the liquid level on the floor shall not exceed a height of 1/2 inch above the top of the sump.

IV. REFERENCES

1. TID-7016, "Nuclear Safety Guide".
2. HW-66936, "Critical Mass Control Specifications - Hoods 7-C and 9-B", R. E. Smith, January 23, 1961.
3. HW-73688, "Critical Mass Control Specification - SN Filtrate Cans - Loading Out From Hood 7-A", L. M. Meeker, May 17, 1962.

V. APPROVALS

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