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**Pacific Northwest Laboratory
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HW-29041

RICHLAND, WASHINGTON

MANFORD ATOMIC PRODUCTS OPERATION

August 13, 1953

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This document consists of 4
pages.

This document classified by *W. Harty*

PROJECT CG-551

ADDENDUM TO

BASIC PROCESS AND EQUIPMENT REQUIREMENTS FOR

MODIFICATION OF RMA TASKS II & III - 234-5 BUILDING EXPANSION

SPECIAL RE-REVIEW

FINAL DETERMINATION

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BY *JP Desousa* DATE *3-2-82*
BY *AE Barber* DATE *3-5-82*

BY

W. P. Ingalls

General Electric Company - Design Section

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RADIATION SHIELDING

Task II

Inasmuch as the scope of the work for this project for Task II involves only the addition of a seventh furnace, identical to the existing six furnaces, no special shielding will be required other than ordinary hood walls to contain the product to prevent spread of contamination.

Task III

The plutonium fluoride powder produced in Task II emits a substantial neutron and gamma radiation. It has been determined that shielding of personnel from this radiation will be necessary at some locations. The basic requirements to be met are as follows:

1. Locations that operating personnel must occupy constantly or nearly constantly must be shielded so that the total radiation exposure received by personnel does not exceed 60 mrem during a normal shift week.
2. Locations that require no occupancy other than for intermittent servicing, load-in of materials, maintenance, or equipment inspection, and locations that serve only as passageways through the Task III Area need not be shielded, but are to be regulated as exposure zones.
3. Shielding of operating positions must provide for necessary visibility to the equipment from the operator's station. Clear plastic (lucite, plexiglass, or equal) shall be used for windows in shielding.
4. Opaque shielding material, where required shall be of a material high in hydrogen content such as masonite or an asphalt compound. Suitable means for rendering the wall fire-resistant shall be incorporated if necessary. Shielding walls need only be high enough to shield personnel in normal positions.
5. No shielding will be required for protection above or below the Task III process area.

The shielding to be installed, to meet the above requirements, is shown on Scope Drawing No. SK-2-867. The constantly occupied operating positions in Zone 1 are

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to be shielded with a wall that replaces the present barrier between Zone 1 and Zone 3. It will extend from the present wall between Tasks II and III on the east to a point just west of the third furnace hood H-13-C where it will connect to a transverse (north-south) wall. The transverse wall will shield personnel operating at the pickling, bomb unloading, and sampling stations in Zone 3, and will shield the Zone 1 Area west of the end of the barrier shield.

The barrier wall will consist of 6" masonite from the floor to 3'-6" high, and 6" thick lucite panels from 3'-6" to 7'-6" high. The masonite and lucite will be beveled and fitted to eliminate cracks or holes in the shielding that might allow thin rays of radiation to shine through.

The transverse wall will be fitted around the outside of Hood H-14-CC, and a block of masonite will be fitted inside of this hood to maintain continuity of the wall. An opening in the wall inside of Hood H-14-CC will be necessary to allow material to pass through the slat conveyor, thus it will be necessary to identify a potential radiation zone where this beam of radiation will occur. The wall will extend about seven or eight feet high, back through Zone 3 nearly to the back wall of Col. D. An ordinary metal door will be installed in the wall at this point. From the top of the shielding portion of the wall, sheet metal will be installed to the ceiling to isolate the furnace section of Task III from the rest of the Zone 3 Area.

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