



UNION CARBIDE CORPORATION
MEDICAL PRODUCTS DIVISION
P.O. BOX 324, TUXEDO, NEW YORK 10987
TELEPHONE: 914-351-2131

September 6, 1979

U. S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, PA 19406

Attn: George H. Smith, Chief
Fuel Facility & Material Safety Branch

Subj: Inspection 70-687/79-02

Dear Sir:

The report of the above reference inspection identified certain activities that were not conducted in full compliance with NRC requirements. Our comments on these items of apparent non-compliance are respectively as follows:

ITEM A

The routine radiological survey of the Uranium Plating Laboratory and other laboratories where U-235 is handled consists of continuous air sampling, routine surveys for removable contamination on floors and horizontal surfaces, personnel monitoring with film badges and dosimeters, and area monitors with alarm set points for low levels of direct radiation. It also provides α monitoring equipment at the exit of the area where alfa work is carried out.

All people have been instructed in the practice of monitoring oneself routinely after working in an area where contamination is probable. Appropriate portable and standing low level radiation personnel monitors are placed in convenient locations for this purpose.

7912070 086

A directive has been issued to remind all personnel of the advantages in frequent checks for contamination of self and working areas when working with radioactive material and also of the requirement to monitor oneself when leaving the plating area on the second level of Building 2 or when leaving either Buildings 1 or 2.

ITEM B

The arrangement of Drum Storage in a hot cell shows 5 drums arranged radomely in an essentially planar array. Some drums are on a stand for either loading with waste or in readiness for transfer to waste shipping containers. Other drums are resting on the floor of the hot cell. Since the difference in elevation among these drums is less than half the height of the 55 gallon 17H drum, it could be said that this represents a planar array.

The above consideration notwithstanding, it may be concluded that stacking drums containing uranium under the present license limits is within the intent of the license to prevent criticality. The maximum amount of U-235 allowed in a single drum is 300 grams. If it were distributed uniformly in aqueous solution throughout the volume of the drum, the concentration would be no more than 1.2 grams U/liter. If an infinite number of similar drums were packed together as closely as possible, in all dimensions, the average concentration would be less than 1.2 grams U/liter.

The single parameter limit on the concentration of U in uniform aqueous solution is 11.5 grams U/liter^{1,2}. The concentration in a typical waste drum is 1/10 this limit. Furthermore, it is not uniformly distributed and thus is in a less reactive state. Any number of drums limited to 300 grams U-235 each would be safely subcritical by a wide margin even if closely packed in all three dimensions.

¹TID-7016: Nuclear Safety Guide, Rev. 2, (Fig. 2.1)

²ANSI-STD. N 16.1-1975, (Table 1)

ITEM C

Our practice with regard to license conditions 14 and 15 has been as follows:

1. MBA-I, (Feed Material Storage Cabinets):

Mass limits were posted at each cabinet and a running inventory record of material in storage was kept in log books for each storage cabinet.

2. MBA-II, (a) Plating Labs, Solution Make-Up Lab, Welding Lab:

Mass limits and current balance on hand were posted in each laboratory. A running inventory record of all the material in MBA II was kept in the log for this material balance area without differentiating among the laboratories in which it was distributed.

MBA-II, (b) Q.C. Lab, and H.P. Lab:

Mass limits were posted in each area and a running inventory record was kept in the log book for each area.

3. MBA-III, Reactor Core and Target Storage Cabinet:

Mass limits were posted in the office/storage locker area where finished targets were stored awaiting irradiation in the reactor core. A running inventory record was kept in the MBA log book. The mass limit on reactor core is regulated by the technical specifications of the reactor. A running inventory record is maintained in the MBA log book.

4. MBA-IV, Hot Cells:

Mass limits and current balances were posted at the window of each hot cell. A running inventory record is maintained for the entire material balance area in the MBA log without differentiating among the hot cells.

Wherever a current balance was not posted along with the limit for any location, the mass limit sign included instructions to refer to the MBA log before bringing material into that area.

September 6, 1979

We believe that the current system has been effective in controlling the quantity of SNM being handled in a particular location but it is not in strict accordance with license conditions 14 and 15. Since our record keeping for MBA I, Q.C. Lab, H.P. Lab and MBA III satisfy the requirements of these license conditions, a similar system of keeping a running inventory record shall be put into practice in the Welding Lab, Solution Make-up Lab, Plating Lab, Waste Solution-Storage Lab and the five Hot Cells.

ITEM D

We note that the storage drawer in the Quality Control Laboratory was posted with a "Radioactive Materials" warning at the time of the inspectors visit and that the appropriate warning for the door to the lab was attached shortly thereafter.

So that further deficiencies will not occur in the area of proper labeling, a memorandum has been issued to all personnel reminding them to be on the alert for unmarked storage of radioactive materials on site and to bring these areas to a supervisor's attention so that they may be properly posted.

All of the above corrective actions either have been or will have been accomplished within one week after this response.

Very truly yours,


James J. McGovern
Business Manager
Radiochemicals

JJMcG:js

cc: R. E. Bollinger
D. B. Holzgraf
C. J. Konnerth
M. H. Voth