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JAN 2 1981

Docket No. 70-687

MEMORANDUM FOR: Lee Rouse, Chief, Advanced Fuel and Spent Fuel Licensing Branch
Division of Fuel Cycle and Material Safety, NMSS

FROM: William O. Miller, Chief, License Fee Management Branch, ADM

SUBJECT: FEE CATEGORY ASSIGNMENT FOR LICENSE SNM-639

On November 5, 1980, we sent a letter (Enclosure 1) to Union Carbide Corp. (UCC) which informed them that, as a result of the issuance of Amendment 3 to License SNM-639 on March 26, 1979, the fee category for the subject license should have been changed from 1G to 1D. Fee Category 1D was assigned to License SNM-639 because Amendment 3 increased the possession limit from 4.6 kgs to 13 kgs of U-235 (3 kgs unirradiated and 10 kgs irradiated U-235) for use in activities other than fuel fabrication and processing. (Fee Category 1G is for those licenses which authorize from 350 grams to 5 kgs of snm).

In UCC's December 2, 1980 response (Enclosure 2) to our letter, however, they informed us that even though Amendment 3 authorized 13 kgs of U-235, they were restricted by an earlier safeguards amendment (Amendment MPP-3 dated January 30, 1979) to an aggregate quantity of less than 5 kgs of unirradiated U-235. Consequently, UCC believes that since Amendment MPP-3 effectively limits the quantity of unirradiated U-235 they may possess and use to less than 5 kgs, the fee category for License SNM-639 should be 1G instead of 1D.

Based on a further review of the license file, it appears that the safeguards amendment (MPP-3) does limit the actual amount of unirradiated U-235 which UCC may possess and use to less than 5 kgs, notwithstanding the 13 kgs authorized in Amendment 3. To assist us in determining the correct fee category for the subject license, and so that we may respond to UCC's letter, please furnish us with (1) the actual amount of U-235 UCC is allowed to possess and use under their license, (2) a description of the authorized use of the 13 kgs of U-235, and (3) your opinion as to whether there is a conflict between what the license authorizes and the safeguards amendment (MPP-3) issued January 20, 1979. In addition, during the period between March 26, 1979 and June 27, 1980, was the irradiated fuel authorized by the license for storage only?

We appreciated your assistance in this matter.

Signed C. James Holloway, Jr.

William O. Miller, Chief
License Fee Management Branch
Office of Administration

OFFICE ▶						
SURNAME ▶						
DATE ▶						

Attachments:
1. Ltr 11/5/80 to UCC fm WOMiller
2. Ltr 12/2/80 fm UCC to WOMiller
3. Amend 3 to SNM-639 dtd 3/26/79
4. Amend MPP-3 dtd 1/30/79
5. 10 CFR 170

DISTRIBUTION:
Docket File (yellow)
R/F (2)
License Fee File
CJHolloway, ADM
ACabell, ADM
KKohler, ADM

OFFICE	LFMB:ADM	LFMB:ADM	LFMB:ADM			
SURNAME	ACabell:jm	CJHolloway	WOMiller			
DATE	1/2/81	1/2/81	1/2/81			

NOV 5 1980

DOCKET NO. 70-687

Union Carbide Corporation
Medical Products Division
ATTN: Mr. Marcus H. Voth
Manager, Nuclear Operations
P.O. Box 324
Tuxedo, New York 10987

Gentlemen:

On March 26, 1979, Amendment No. 3 to License SNM-639 was issued to authorize an increase in the total possession limit of U-235 from 4.6 kilograms to 13 kilograms. The increased possession limit changed the fee category for the license from 1G to 1D, as specified in §170.31 of the enclosed 10 CFR 170. Fee Category 1D is applicable to licenses authorizing the possession and use of 5 kilograms or more of U-235 for activities other than fuel processing and fabrication.

As a result of a recent review of the license file, we found that, through an oversight on our part, the proper fee category was not assigned at the time Amendment No. 3 was issued. As a result, Union Carbide was not assessed the correct fees for those health and safety and safeguards inspections conducted since March 26, 1979 for License SNM-639. The amount of the inspection fees, as well as the maximum number of billings for inspections conducted in a calendar year, is higher for a license in fee Category 1D than for a license in fee Category 1G. Consequently, the following inspection fees are due for License SNM-639 per fee Category 1D, for the period since March 26, 1979:

Safeguards inspections:

1. $3,600 - NRC Invoice 1079M dated January 31, 1980, for the safeguards inspection conducted 4/24 - 4/27/79, Report No. 79-01, will be revised to assess a fee of $7,600 minus the $4,000 fee already paid by your Corporation.

2. $7,600 - Safeguards inspection conducted 8/21-24/79, Report No. 79-04.

$11,200 Total safeguards inspection fees due

Safety inspections:

1. $4,900 - Health and safety inspection conducted 5/14-16/79, Report No. 79-02.

2. $4,900 - Health and safety inspection conducted 1/29 - 2/1/80, Report No. 80-02.

$9,800 Total health and safety inspection fees due

The total amount due for health and safety and safeguards inspection fees is $21,000.

We have notified the NRC Office of the Controller to bill you for the above fees. We apologize for our oversight and delay in notifying you of the correct inspection fees due for License SNM-639. If you have any questions concerning this matter, please let us know.

Sincerely,

(Original Signed By)
Wm. O. Miller

William O. Miller, Chief
License Fee Management Branch
Office of Administration

Enclosure:
10 CFR 170

DISTRIBUTION:
License File
LFMB R/F (2)
Gen. Insp. File
CJHolloway, ADM
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OFFICE	LFMB:ADM	LMB:ADM	LFMB:ADM	LFMB:ADM			
SURNAME	ACabell:ba	Kohler	CJHolloway	WOMiller			
DATE	10/28/80	10/30/80	10/3 /80	10/4 /80			

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

December 2, 1980

William O. Miller, Chief
License Fee Management Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Miller:

Your November 5, 1980 letter notified us of your intent to consider our facility licensed under SNM-639 as a 1D versus 1G facility. We have received invoices 0227N and 0228N implementing that decision. For a number of reasons discussed below, we do not believe the fees are justified and respectfully ask that your request be withdrawn.

You correctly note that on March 26, 1979, Amendment 3 to License SNM-639 increased the total possession limit of U 235 from 4.6 kilograms to 13 kilograms. However, shortly prior to that time, we were issued on January 30, 1979, Material and Plant Protection Amendment MPP-3, which restricts the aggregate quantity of unirradiated U 235 possessed under the license for our Hot Laboratory (SNM-639) and our Reactor (R-81) to be less than 5 kilograms. This restriction has been a severe operating limitation, which does not allow the full range of operational flexibility of a Category 1D facility. Since we are not licensed for the full range of activities allowed under Category 1D, it is inconsistent that we be charged for activities not permitted by our license. Note that under the R-81 license, this fact is considered in that 10CFR 170.24 assesses a lesser fee for safeguards inspections of facilities limited to fuel of moderate strategic importance relative to facilities allowed to possess fuel of high strategic importance. In our case, the aggregate quantity of special nuclear material under the Hot Lab and Reactor license is limited to a quantity of moderate strategic importance.

A complication exists with your proposal of back charging, assuming it should remain your position that billing under Category 1D is fair and justified. The majority of the proposed back charge is for 1979; the books for that year have been closed. The portion for 1980 activity was not budgeted and is therefore not available. Furthermore, the proposed increase for our fiscal year 1981 was not anticipated in our budget which has been approved for next year. Since the oversight was not the result of any error on our part, we consider back charging to be unjustified.

An important factor we would like to impress on you is the impact of regulatory expenses on the operation of our facility. Regulators frequently assume that charges such as you propose are insignificant and go unseen in an organization as large as Union Carbide. On the contrary, the cost of regulation to the corporation is a significant amount. Our concern with the matter at hand is based on the divisional level. The Medical Products Division is a small operation, attempting to survive economically while providing radioisotopes to patients at a cost which is both reasonable and competitive with foreign producers. Regulatory fees charged by the NRC for operating our Reactor and Hot Laboratory under the proposed category total 10-20% of the total salary budget for the professional operating staff of the facility. Our main competitor in the production of reactor-produced medical radioisotopes is in Canada where no such cost penalties are known to exist. We consider it in the national interest to maintain this vital function, rather than regulate it out of the country, as has happened to numerous other components of the nuclear industry.

In summary, we ask that you reconsider your suggestion to change SNM-639 from a 1G to a 1D facility. We find that maintaining 1G status is within the scope of the existing fee schedule. It is the correct category since activities licensed under SNM-639 are limited in such a manner that the full range of activities allowed under 1D are specifically prohibited. We also ask that viability of U.S. industry, burdened by over-regulation, be considered in the face of foreign competition. We will place invoices 0227N and 0228N on hold, pending further communication from you.

Yours very truly,

Marcus H Voth

Marcus H. Voth
Manager, Nuclear Operations

Distribution:

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MAR 26 1979

FCPF:JCD
70-687
SNM-639, Amendment No. 3

Union Carbide Corporation
ATTN: Mr. Marcus Voth, Manager
Nuclear Operations
P. O. Box 234
Tuxedo, New York 10987

Gentlemen:

In accordance with your applications dated October 13 and November 17, 1978, and pursuant to Title 10, Code of Federal Regulations, Part 70, NRC Materials License No. SNM-639, is hereby amended as follows:

I. Items 6D, 7D and 8D are deleted -

II. Items 7B, 8B and 9 are amended to read:

7.B. As irradiated and unirradiated target samples, in up to two irradiated fuel assemblies containing no more than 200 grams U-235 per assembly, and in laboratory standards and reagents.

8.B. 13 kilograms of U-235

9. The special nuclear material is for use in accordance with the statements, representations, and conditions specified in the licensee's applications dated April 28 and May 21, 1969; November 5, 1970; February 8, June 13, June 29, and August 13, 1973; May 28, 1974; February 11, 1975; August 12, 1976; and May 3, October 13, and November 17, 1978.

III. Condition No. 17 is added as listed below:

17. The licensee shall empty and clean the unsafe geometry container in the waste storage laboratory after each batch of not more than 350 grams of U-235 have been processed through the plating laboratory and shall maintain records showing that the container has been emptied after each 350 gram batch is processed.

Bin #17

OFFICE ▶						
SURNAME ▶						
DATE ▶						

All other conditions of this license shall remain the same.

The above license conditions were discussed with and agreed to by Mr. Mark Voth, representing Union Carbide Corporation, and J. C. Delaney of my staff on March 12, 1979. Please note that this license amendment does not authorize the U-235 reclamation program referred to in your letter dated November 10, 1978, regarding 10-CFR 73.50. An application for license amendment to authorize such a program should describe the proposed operations in detail and including your nuclear and radiation safety parameters and procedures.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by:
W. T. Crow

W. T. Crow, Section Leader
Uranium Fuel Fabrication Section
Division of Fuel Cycle and
Material Safety

03/26/79 Bin #18

OFFICE ▶	FCPF	SG PL	FCPF			
SURNAME ▶	JCDelaney:jse	RFonda WMM	WTCrow			
DATE ▶	03/ /79	03/26/79	03/26/79			

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 2 6 1979

Docket No.: 70-687

Applicant: Union Carbide Corporation (UCC)

Facility: Corporate Research Laboratory

Subject: LICENSE AMENDMENT APPLICATIONS DATED DECEMBER 28, 1977, WITH SUPPLEMENTS DATED MAY 3, AND OCTOBER 13, 1978.

Background

The December 28, 1977, application requested that (a) the quantity of special nuclear material in a single hot cell be increased from 650 grams to 2650 grams and, (b) that the possession limit of U-235 under the license be increased from 4600 grams U-235 to 3000 grams of unirradiated U-235 and 10,000 grams of irradiated U-235. The May 3, and October 13, 1978, supplements provided supporting data for the increased mass limits in hot cells. A license amendment was issued on October 30, 1978, approving the increased quantities in hot cells. The 13 kilogram mass limit, however, was not approved at that time because the licensee did not meet the requirements for physical protection of licensed activities for the higher U-235 possession limit as required by 10 CFR 70.53.

Discussion

By letter dated January 30, 1979, Union Carbide Corporation was advised that an exemption from the requirements of 10 CFR 73.50 had been granted and that the UCC Materials and Plant Protection Amendment MPP-3 had been amended by adding Section 9 (a copy of which is attached) which contains the conditions of the exemption.

Nuclear Safety

Although the total mass of U-235 which the licensee may possess is being increased there is no change in the safe parameters discussed in the previously referenced SER of October 30, 1978. However, at the request of Mr. Jerry Roth, I&E, Region I, and with the concurrence of Mr. Mark Voth, UCC, I have added License Condition No. 17 as follows:

17. The licensee shall empty and clean the unsafe geometry container in the waste storage laboratory after each batch of not more than 350 grams of U-235 have been processed through the plating laboratory and shall maintain records showing that the container has been emptied after each 350 gram batch is processed.

Radiation Safety and Environmental

The change in possession limit does not affect the currently approved radiation safety procedures nor the environmental considerations.

Recommendation

On the basis of the above, I recommend that the license be amended as requested by the licensee.

J. C. Delaney

Approved: W. T. Crow
W. T. Crow

70-68

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

CORPORATE
LABORATORY

RECEIVED

1977 DEC 30 AM 10 34

December 28, 1977

Mr. Sheldon Meyers
Director Fuel Cycle
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attn: Mr. J. A. Power
Ass't Director Licensing, Safeguards

Subj: Request For Amendment To Special Nuclear Materials License 639.

Gentlemen:

It is requested that the subject license be amended as follows:

(a) The quantity of special nuclear material that is allowed in a single hot cell be limited to 2650 grams. (Change from 650 grams.)

(b) The special nuclear material that is contained in targets that have been irradiated for one 120 hour operating cycle in the Union Carbide Nuclear Reactor or waste solutions from such targets be considered self-protected material and therefore exempt from the 5 Kg formular quantity limitation in accordance with 10 CFR 73.6.b. The limit of total unirradiated material will be 3 Kg and the limit of the total irradiated, self-protected material will be 10 Kgs.

A criticality analysis in support of the requested change for the in-cell limit is enclosed (ENCLOSURE 1). This analysis shows that the granting of this amendment will not result in an unsafe condition.

An analysis of the radiation dose from irradiated targets is enclosed (ENCLOSURE 2) in support of the requested exemption of irradiated material from the 5 Kg limit. It is understood that the regulations of Part 73.50 must be adhered to if the 5 Kg limit is exceeded, regardless of the self-protecting nature of the material. The UCNR, licensed in accordance with 10 CFR 50, has had a Physical Security Plan (ENCLOSURE 3) in effect for several years. The hot laboratory building is adjacent to the reactor building and it has always been a part of the protected area under the plan in accordance with Part 50. Since operations with the material licensed under SNM-639 are conducted in both the reactor and hot lab buildings, a copy of this plan is submitted with this application to become an SNM-639 license requirement in the event the total SNM possessed under this license exceeds the 5 Kg formula quantity.

This license amendment is requested because of the quantum increase in production at our facility which has been required as a result of the GETR shutdown. We were also requesting the increased limit in the quantity of stored irradiated SNM in anticipation of transferring this material to the Savannah River Plant (SRP) for reprocessing. The ability to store irradiated material for up to 90 days prior to shipment to SRP will facilitate the salvage of this U-235.

Thank you for your consideration.

Very truly yours,

James J. McGovern
Manager
Radiochemical Production

JJMcG:js
Enclosures

IN-CELL STORAGE OF SPECIAL NUCLEAR MATERIAL

Present In-Cell Storage:

Waste solutions of SNM (93%-enriched in U-235) are stored in borosilicate glass bottles. Up to 200 ml of aqueous solution, nominally 100 g/l of U-235 is contained in each bottle. Bottles are stored within a cell in a three-row linear array defined by a metal rack. Each hot cell is currently limited by license to a total of 650 g U-235.

Proposed In-Cell Storage:

While retaining the existing bottle storage it is proposed to add additional storage within each cell. The waste solutions from a number of bottles are to be combined and transferred to thick-walled metal cylinders (14.6 cm ID, 30 cm inside height, 5.6-liter volume), as shown in DWG. 101308 (enclosed). Cylinders will be held upright in a metal rack located so that cylinders are separated from the bottle storage area by at least 30 cm. Each cylinder is capped after filling. Cylinders are designed so they cannot be stacked vertically on top of each other. The contained solution may, or may not, be solidified through addition of portland cement or similar inert materials. Only ½ the volume of the cylinder is taken up by the contained solution, therefore the effective height of the cylinder is approximately 15 cm.

Proposed In-Cell Storage: (cont'd)

A limit of 150 g U-235 in a single cylinder, and a total of 2000 g U-235 in all cylinders within a cell is proposed. These limits are in addition to those already existing for bottle storage. The combined storage limit for each cell will then be 2650 g U-235. The criticality safety of the proposed in-cell storage is examined below.

Criticality Safety Of In-Cell Storage:

The 30 cm separation between the cylinders and the bottle storage effectively decouples the SNM stored in the two areas (Ref. 1, p. 35; Ref. 2, Fig. 58) so that the SNM in the cylinders can be considered separately. With 150 g U-235 in a 5.6L(~3 liter effective) cylinder, the concentration is ~ 50 g U-235/liter, which is about equal to the normal concentration of the waste. The solution height is 15 cm (max.) and its diameter is 14.6 cm.

From Ref. 2, Fig. 58 (copy attached) the critical height for a water reflected 14.9 cm inside-diam. cylinder containing SNM of optimum concentration for minimum critical height (537.6 g/l) is 73 cm. The critical mass is therefore $\pi/4 \times 14.9^2 \times 73 \times .5376 = 6.84$ Kg. A 30 cm length would contain $6.84 \times 30/73 = 2.8$ Kg and would be subcritical. The proposed 150 g limit for a single cylinder is a factor of almost 19 below this already subcritical limit. The normal waste concentration is less than 100 g/l which is considerably below the optimum of approximately 540 g/l for a 15 cm-diam. (6-in.) cylinder (Ref. 2, Fig. 57; Ref. 3, p. 29 - copies attached). Due to the fixed volume, double batching is not a consideration, but even if the U-235 mass in a cylinder could be doubled to 300 g, it would still be well below the subcritical 2.8 Kg.

JAN 30 1979

SGPS:RRR
70-687

Union Carbide Corporation
Sterling Forest Research Center
ATTN: Mr. Marcus H. Voth
Manager, Nuclear Operations
P. O. Box 324
Tuxedo, New York 10987

Gentlemen:

Reference is made to your letter of November 10, 1978 regarding a request for exemption from 10 CFR 73.50 for certain special nuclear material under License No. SNM-639. We have determined that an exemption to the requirements of 10 CFR 73.50 as pertains to irradiated target material is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.

Accordingly, we are hereby amending Materials and Plant Protection Amendment MPP-3 to your License No. SNM-639 by adding Section 9 as set forth in the enclosure to this letter, effective immediately.

Sincerely,

Robert F. Burnett, Director
Division of Safeguards

Enclosure:
As stated

Enclosure A

Section 9 Materials and Plant Protection Amendment
MPP-3 to License No. SNM-639.

9.0 The licensee shall comply with the following provisions:

9.1 The combined amount of uranium-235 possessed under License Nos. R-81 and SNM-639 which is contained in uranium enriched to 20 percent or more in the U-235 isotope and which is not irradiated shall be less than 5,000 grams.

9.2 The licensee is not required to include uranium-235 contained in irradiated target material in calculations of the 5,000 gram threshold for application of 10 CFR 73.50 provided that the hot cells are protected within a protected area so that irradiated target material located there is afforded the same protection measures as given to irradiated fuel elements in the reactor building under the licensee's approved reactor security plan, and

(a) locks and alarms which annunciate upon unauthorized use when the area is unoccupied are provided to either the hot cell manipulators or hot cell doors

(b) any irradiated target material located in the transfer channel or reactor pool is in a container which has an external radiation dose rate of 100 rem at 3 feet from its surfaces without intervening shielding and equipment for handling such containers is provided with locks and alarms which annunciate upon unauthorized use when the area is unoccupied.

JAN 30 1979

SGPS:RRR
70-687

Union Carbide Corporation
Sterling Forest Research Center
ATTN: Mr. Marcus H. Voth
Manager, Nuclear Operations
P. O. Box 324
Tuxedo, New York 10987

Gentlemen:

Reference is made to your letter of November 10, 1978 regarding a request for exemption from 10 CFR 73.50 for certain special nuclear material under License No. SNM-639. We have determined that an exemption to the requirements of 10 CFR 73.50 as pertains to irradiated target material is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.

Accordingly, we are hereby amending Materials and Plant Protection Amendment MPP-3 to your License No. SNM-639 by adding Section 9 as set forth in the enclosure to this letter, effective immediately.

Sincerely,

Robert F. Burnett, Director
Division of Safeguards

Enclosure:
As stated

Enclosure A

Section 9 Materials and Plant Protection Amendment
MPP-3 to License No. SNM-639.

9.0 The licensee shall comply with the following provisions:

9.1 The combined amount of uranium-235 possessed under License Nos. R-81 and SNM-639 which is contained in uranium enriched to 20 percent or more in the U-235 isotope and which is not irradiated shall be less than 5,000 grams.

9.2 The licensee is not required to include uranium-235 contained in irradiated target material in calculations of the 5,000 gram threshold for application of 10 CFR 73.50 provided that the hot cells are protected within a protected area so that irradiated target material located there is afforded the same protection measures as given to irradiated fuel elements in the reactor building under the licensee's approved reactor security plan, and

(a) locks and alarms which annunciate upon unauthorized use when the area is unoccupied are provided to either the hot cell manipulators or hot cell doors

(b) any irradiated target material located in the transfer channel or reactor pool is in a container which has an external radiation dose rate of 100 rem at 3 feet from its surfaces without intervening shielding and equipment for handling such containers is provided with locks and alarms which annunciate upon unauthorized use when the area is unoccupied.