GULF UNITED
NUCLEAR FUELS CORPORATION

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January 7, 1972

In Reply Refer to NIS:REK-72-329

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rec 2/6/72
date

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Director, Division of Materials Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Attention: Mr. Donald A. Nussbaumer, Chief
Fuel Fabrication & Transportation Branch

Subject: Fabrication of High Enrichment Pellets and Rods

Reference: SNM-33, Docket 70-36

For Dir. of Compliance

Gentlemen:

Gulf United Nuclear Fuels Corporation requests amendment of AEC License SNM-33 to include fabrication of high enrichment pellets and rods. Pellet fabrication will be performed at the Chemical Operation, Hematite, Missouri, and rod fabrication will be performed at the Fabrication Operation, New Haven, Connecticut. Pellet production will be similar to that currently approved for low enrichments at the Chemical Operation and rod fabrication will be identical to that currently approved for low enrichments at Fabrication Operation. Attached are two new subparts to the referenced license which describe the proposed processing. It should be noted that this processing would consist of a series of intermittent runs of small quantities of SNM which we plan to perform between major production campaigns of low enrichment materials. Information for the Fabrication Operation has been numbered 927 to reflect proposed numbering (Section 900) for the description of that Operation which was recently transferred to SNM-33.

Current commitments require the start of these operations in early February, 1972. Therefore, please assign top priority to this application over other pending Gulf United applications currently under review. Your early consideration is respectfully requested.

Sincerely,

Peter Loysen

Peter Loysen, Manager
Nuclear and Industrial Safety

PL-REK/pl

Attachments

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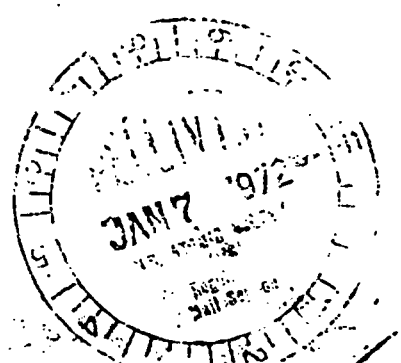

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'27.1 General Considerations

1. This subpart covers the fabrication of high enrichment rods. The enrichments vary from low (less than 5%) to high (97%). The SNM is in the form of sintered pellets which is then encapsulated in zirconium, aluminum, or steel tubes.

2. Pellet inspection and tube loading will be performed in Buildings 10H or 50H and rod fabrication will be performed in Building 50H.

3. When processing varying enrichments, nuclear criticality safety limitations will be determined based on the highest enrichment in process.

4. If processing enrichments greater than 5% in Building 10H, the equipment involved will either be segregated from material with lower enrichments by the use of physical barriers such as fences or the material with lower enrichments will be removed from the process area.

5. Safe cross section values used in Subpart 927.2 will be obtained using the safe diameter values shown on Figure 309-XX . The cross section will be calculated using:

$$\text{Safe Cross Section} = \frac{\pi \times (\text{safe diameter})^2}{4}$$

6. Unless stated otherwise, safe values referenced in Subpart 927.2 will be obtained using the following figures.

	Safe Value	Figure
6.1	Cylinder Diameter	309-XX
6.2	Slab Thickness	309-XX
6.3	Mass	309-XXI
6.4	Volume	Table XIII, K-1019, Rev. 5

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927.2 Process Description

1. Receive Pellets
   Pellets will be received and stored in the shipping containers or in racks as described in Subpart 912.4 (formerly 812.4).

2. Measure and Weigh Stack
   This is a dry operation and will be limited to a safe mass. If pellets are damaged, they will be placed in a safe diameter or volume or cross section container or they will be mass limited.

3. Pellet Dryness Test
   A few representative pellets may be removed from each batch or lot and tested for dryness. This operation will be limited to a safe mass.

4. Load and Weld
   Pellets are loaded into tubes and the end plugs added and welded to the tubes during this operation. Rods will be welded individually or in a vacuum chamber which is dry and will be limited to 10 kgs U^{235} as listed on Table 309-I.

5. Machine or Hand Finish Welds
   This operations is usually performed on individual loaded rods one at a time and is limited to a safe mass.

6. Inspect
   This operation will be limited to a safe mass.

7. Zyglo Test
   Dye penetrant is brushed on the welded end caps and the welds checked. Test materials are removed by dipping the ends of the rods in a liquid, usually only one to two inches. This process step is limited to a safe mass.

8. Leak Test by Alcohol Immersion
   Prior to leak testing, rods are immersed in alcohol. This is a wet operation and limited to a safe mass or the rods are held by a fixture with a safe cross section or the equipment has a safe diameter or cross section.

9. Helium Leak Test
   This operation is dry and performed in leak tight chambers. Each chamber is limited to 10 kgs U^{235} as listed on Table 309-I.

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927.2 Process Description (continued)

10. Clean & Pickle
This operation will be performed as described in Subpart 923.2.10 (formerly 823.2.10). The fixture will be Corrosion Rack E-302863-4, except that the diameter of the spacer plates used to hold rods will be limited to a safe diameter determined using Figure 309-XX. Also, the weight limitations on the number of rods will not be exceeded (997.5 lbs). On fuel rods shorter than four feet, the central containment ring show for fixture E-302863-4, will be deleted because of increased column stiffness of the shorter rods.

11. Corrosion Test
This process step will be performed as described in Subpart 923.2.11 (formerly 823.2.11).

12. Visual Inspection and Alpha Count
These operations are limited to a safe mass.

13. Store
Rods will be stored in racks as described in Subpart 914.3 (formerly 814.3) except that each opening will be physically reduced to a safe cross section. Racks used for this storage will be identifed as containing high enrichment rods.

14. Package
Rods will be placed in approved shipping containers and prepared for shipment.