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20 February 1958

Mr. Lyall Johnson
Licensing Division
U. S. Atomic Energy Commission
Washington, D. C.

SUBJECT: Special Nuclear Materials License No. SNM-33

Dear Mr. Johnson:

This communication is a request for expansion of our Special Nuclear Materials License No. SNM-33 to include a UO_2 pelleting facility which is described below.

The basic operations in the manufacture of pellets that we are proposing essentially follow the procedures developed at Bettis Field. These steps include (1) addition of a binder and lubricant to the powder, (2) granulation, (3) drying, (4) pressing, (5) firing, (6) grinding, and (7) inspection. It is our proposal to always operate on a batch basis using "limited safe" batch sizes depending upon assay.

Step 1: The blending of the binder and lubricant will be accomplished with a slow speed mixing device to minimize dust generation. The entire mixer will be enclosed in a dust tight hood. No more than a "limited safe" batch for a given assay will ever be used as the batch size in the blending operation.

Step 2: The material will then be granulated using equipment especially designed for this purpose and the granules spread out in a thin layer in drying trays. These operations will be carried out in an especially designed hood to reduce the movement of material to a minimum. The tray loading will be accomplished within a dust control box.

Step 3: Drying ovens will form an intrinsic part of the wall of the tray loading dry box so that trays can be directly introduced into the ovens. No more than a "limited safe" batch will be permitted in any oven at one time.

Step 4: Following drying, the trays will be removed from the ovens and emptied into especially designed containers through a bottom opening in the dry box. No more than a "limited safe" batch will be placed in a container.

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Step 5: These containers will be emptied directly into the feed mechanism of the pelleting press. The entire press will be enclosed in a plastic-metal dust tight hood.

Step 6: The pellets so generated will be placed on trays and stoked into a multi-zone furnace for dewaxing and sintering. The trays will have dimensions of 4"x6"x1" and will be stoked through the furnace as a single layer.

Step 7: The pellets will be unloaded from the trays and processed in one of two manners. If grinding is required, they will be placed in suitable containers and transferred to the grinding station. If grinding is not required, as we anticipate will be the condition in a majority of cases, pellets will be placed in suitable containers and transferred to an inspection table for accurate dimensional checks.

Step 8: Pellets which must be ground will also proceed through the inspection table prior to final packing.

Step 9: It is anticipated that in some cases we may be requested to load pellets into fuel pins. When this is to be accomplished, individual fuel pins will be loaded immediately following pellet inspection, the fuel pins sealed in the appropriate manner, and shipped in an approved manner to the eventual user. In those cases where we are to deliver pellets to a fuel element fabricator, pellets will be packaged in approved shipping containers with no more than a "limited safe" batch in each container, placed in birdcages and shipped by approved methods.

The entire pelleting installation will be designed with dust control as the paramount consideration from a safety standpoint. Since "limited safe" batch size will never be exceeded at any step of the operation, nuclear safety is insured. Special attention will be directed toward the choice of equipment and procedures which will minimize the amount of dust generated and all operations which are potentially dusty will be enclosed in hoods to localize the contamination.

It is contemplated at the beginning to install a single pellet production line which will be capable of handling any assay of pellet which may be required. The powder preparation equipment, pellet press, furnaces and all hoods are so designed that it will be quite simple to clean and change from assay to assay. Operating procedures are such that it will be a relatively simple matter to control inventory flow and be assured that even on high assays no more than a single "limited safe" batch will be contained in any step of the process.

Since we have been requested to begin making sample batches of pellets at an early date, we are requesting your immediate attention to this application so that our service to the nuclear power industry may be so expanded.

Sincerely yours,

MALLINCKRODT CHEMICAL WORKS

W. H. Leaders
Technical Director
Special Metals Division

WHL:dj

City of St. Louis)
State of Missouri) SS

Subscribed and sworn to before me this day of 1958

Notary Public