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June 15, 1962

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UNITED NUCLEAR CORPORATION'S APPLICATION FOR AMENDMENT TO LICENSE
BEM-33 TO INCLUDE DRY UO_2 (5% MAXIMUM ENRICHMENT) PELLET VACUUM
DEGASSING AND FUEL LOADING - MAY 14, 1962 - DOCKET 70-36

Ref: DLR:FKD

In response to your memorandum of May 18, 1962, we have reviewed the
subject application.

Equipment to include vacuum drying oven and loading dry box for
 UO_2 pellets is to be installed in the currently licensed pellet
plant (United Nuclear application dated December 10, 1953).

The dry UO_2 pellets (5% maximum enrichment) will be made up into
stacks approximately 30" long. Each aluminum tray will hold 15
stacks. A maximum of 7 trays will comprise 1 degassing batch.
No more than 2 degassing batches (1 batch in the oven and the
second in the dry box) will be in process at any one time.

Operational safety for enrichments up to 2.4% is based on lack
of moderation. According to TID-7016, Rev. 1, unmoderated uranium
compounds of low enrichments require no further restrictions. In
view of the fact that the pellets are dry before loading in the
oven as a result of having been sintered in temperatures in excess
of 1,000° centigrade, lack of moderation can be assumed. The oven
is fitted with an exterior water coil to facilitate cooling at the
end of the drying cycle. If a leak were to develop in the coil,
two conditions as follows, would have to prevail to constitute a
criticality hazard:

- (1) A leak in the stainless steel lining of the oven
would also have to develop in order for the water
to enter the oven.
- (2) The nonexistence of a vacuum in the oven would have to
go undetected during the entire heating portion of the
cycle since if a leak exists in the lining of the oven,
a vacuum cannot be achieved.

These two possibilities seem so remote as to be improbable in view
of administrative procedures as established at United Nuclear Corp.

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For enrichments between 2.4 and 5%, safe mass limits for each drying batch will be determined as defined by Figure 13, TID-7016, Rev. 1. At 5% enrichment this safe mass quantity will occupy but one tray. The total solid angle between the batch in the oven and that in the dry box will be less than one steradian compared to the allowable 2.5 steradians permitted for safe mass. Additional safety is evident in view of the fact that lack of moderation still prevails. We are in agreement with these criteria.

The applicant has stated that after removal from the dry box the loaded tubes will be handled in safe batch quantities as defined by Figure 13, TID-7016, Rev. 1.

We recommend approval of the subject application.

Attachment:

Ltr from United Nuclear dtd 5/14/62

DLR:FL:CEB

EDurkan/vj

6/15/62