

SEP 7 1982

DOCKET NO: 70-371

LICENSEE: United Nuclear Corporation (UNC)  
Naval Products Division

SUBJECT: SAFETY EVALUATION REPORT, APPLICATION DATED MAY 10, 1982,  
AND SUPPLEMENTS DATED JUNE 4, JULY 9, AND AUGUST 12, 1982,  
RE RAW FUEL VAULT STORAGE AND HANDLING, 07000371040S

### Background

UNC requests approval of new storage shelves in the raw fuel storage room and approval of new criteria for handling raw fuel in the south end of the storage room. The supplements were submitted to correct some of the errors in the stated densities of the materials, to provide information on the structural integrity of the racks, and to establish some controls on units in the south end of the storage room.

### Discussion

The storage racks are attached to two sides of a 20-inch-thick reinforced concrete wall lined with 1/4-inch stainless steel plates. The twelve shelves on each side of the concrete wall are fabricated from 1/4-inch stainless steel angles welded to the plates. The angle irons are on 11.5-inch vertical centers. The shelves are wide enough to accept one 3-inch ID x 4.7-inch H can. Each can holds about 2 kg of U-235. Doors for each shelf are designed, when closed, to prevent double stacking of cans.

UNC has made a series of Monte Carlo calculations to show that the storage array is subcritical. Because UNC conservatively assumed water moderation of the fuel cans (the fuel is shipped dry) in calculating maximum  $K_{eff}$  of 0.83, the poor statistics for the array calculations are acceptable. The NRC staff assumed only interspersed moderation and independently confirmed the safety of the array.

Structural integrity of the racks was analyzed by UNC. The NRC staff verified that the design provided an adequate safety margin on structural integrity.

In the south end of the room, shipping containers will be loaded and unloaded. In addition, weighing operations will be performed, and batches for further processing will be prepared. Criteria for these operations have been revised. The Criticality Indicator (CI) system of TID-7016; Rev. 2,

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on pp. 88-94, has been proposed for use in this area. UNC would assign a CI of 1 to each unit and limit the area to 20 CI. Each unit would be subcritical if immersed in water and will be separated a minimum 6:1 inches edge to edge.

To assure that each unit will be subcritical and that the 20-unit array is subcritical, the following license condition is recommended:

The 20 units in the south end of the raw fuel storage room may consist of the following in any combination:

- a. Not more than 20 shipping containers, each limited to 8.7 kg U-235,
- b. not more than two fuel weighing hoods, each limited to 5 kg U-235, provided only one fuel storage can is open at a given time.
- c. not more than one weigh station, limited to 2.2 kg U-235 in one unopened container,
- d. not more than one transfer cart, limited to 8.7 kg U-235,
- e. not more than one fuel can, limited to 2.2 kg U-235, for transport without use of a cart, and
- f. not more than one unit for transport to a pass through port.

These conditions are in addition to the criteria in Section 8.3, Part I, of the amendment applications dated May 10, 1982, and July 9, 1982.

Conclusion and Recommendation

The new storage shelves in the raw fuel storage room and the proposed criteria for handling 20 units of material in the south end of the storage room provide reasonable assurance of nuclear criticality safety, provided that the above license condition is incorporated into the license.

Approval of the application with the license condition is recommended.

Original signed by  
George H. Bidinger

G. H. Bidinger  
Uranium Process Licensing Section  
Uranium Fuel Licensing Branch  
Division of Fuel Cycle and  
Material Safety, NMSS

Approved by: W. T. Crow  
Original Signed By:  
W. T. Crow, Section Leader

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