APPENDIX B

to the

STRUCTURAL REANALYSIS PROGRAM

For The

R. E. GINNA
NUCLEAR POWER PLANT

Addendum to "Criticality Analysis for the Spent Fuel Storage Racks" for Rochester Gas & Electric Corporation Ginna Plant Dated November 1982

by

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In addition to the accident conditions related to the spent fuel storage racks as discussed in Section 5.0 of the original report, another accident condition was evaluated which involves a missile or a high velocity foreign object falling on top of the storage racks. Crushing or compaction of the fuel assemblies caused by impact would compact the fuel lattice and result in a more undermoderated and therefore less reactive configuration as previously described in Section 5.0 of the report.

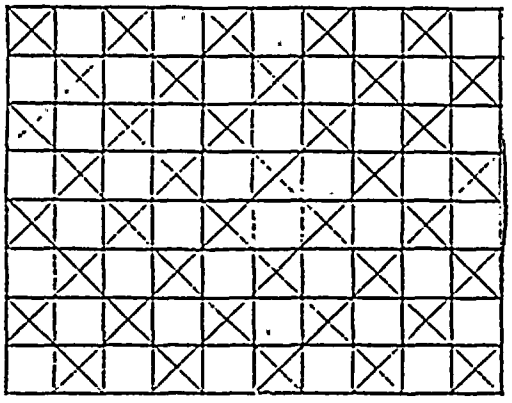
If the missile or the high velocity object is assumed to cause displacement of a fuel storage box, a configuration similar to that depicted in Figure 6(b) could conveivable result. As shown, one water box and one fuel box are assumed to be interchanged as compared to the normal storage pattern [Figure 6(a)]. Figure 6(c) represents a condition which is even more limiting with respect to criticality safety. In the latter case, half of the water boxes in the rack system are assumed to be replaced with fuel storage locations. The resulting k_∞ of this very conservative model is only 0.8894 when the 2000 ppm of soluble boron present in the pool water is included in the calculation. Thus the k_∞ for the assumed accident configuration shown in Figure 6(b) should be significantly less than 0.8894 and much less than the normal

rack cell [Figure 6(a)] k_∞ of 0.9305 (see Table 5) at 68°F, 4.25 w/o U-235 and no soluble boron. Based on this conservative analytic model, the assumed accident involving a missile or high velocity falling object will pose no threat to the criticality safety of the spent fuel storage racks.

Reference 1, Attachment B to Proposed Technical Specification Change, submitted by letter dated February 23, 1983 from John E. Maier, RG&E, to Arnold Denton, USNRC.

Figure 6

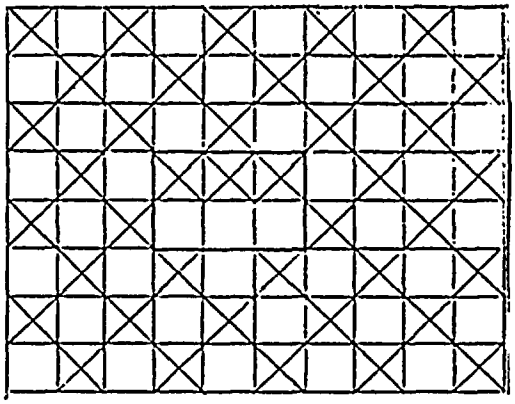
Accident Geometry for Displacement of One Fuel Storage Location Caused by Missile Strike



(a) NORMAL CONFIGURATION

Basic rack cell k_∞ (no soluble boron) = .9305

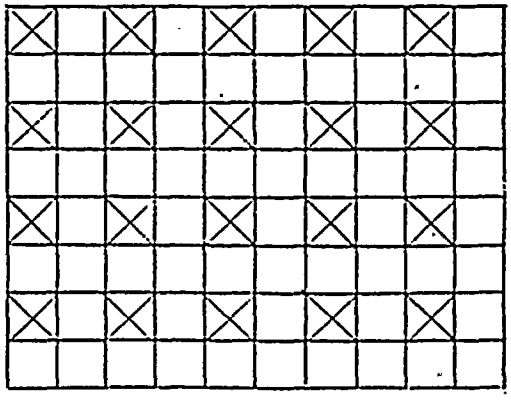
Rack cell k_∞ (2000 ppm (soluble boron) = .6622



(b) ASSUMED ACCIDENT CONFIGURATION

(one water box and fuel box interchanged)

Rack cell k_∞ (2000 ppm soluble boron) < .8894



(c) CONSERVATIVE MODEL OF ACCIDENT CONFIGURATION

(eliminate 50% of water boxes)

Conservative rack cell k_∞ (2000 ppm soluble boron) = .8894