



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
REGARDING THE FUEL HANDLING ACCIDENT INSIDE CONTAINMENT

DRESDEN NUCLEAR POWER STATION UNIT 1  
COMMONWEALTH EDISON COMPANY  
DOCKET NO. 50-10

INTRODUCTION

By letter dated January 17, 1977, the staff requested the Commonwealth Edison Company (the licensee) to evaluate the previously unevaluated potential consequences of a postulated Fuel Handling Accident Inside Containmentment (FHAIC) at Dresden Unit 1. The licensee submitted, in a letter dated March 18, 1977, an evaluation of the FHAIC. In the licensee's evaluation, he assumed that all the fuel pins in the equivalent of a single fuel assembly failed following the dropping of a fuel assembly onto the top of the core. The licensee stated that the potential consequences of this postulated accident are 11 Rem thyroid and 0.05 Rem whole body at the Exclusion Area Boundary (EAB). The licensee concluded that these doses are well below the guidelines of 10 CFR Part 100.

EVALUATION

We have completed our review of the licensee's March 18, 1977 submittal and concluded that the consequences of the accident postulated by the licensee are within the guidelines of 10 CFR Part 100 and therefore are acceptable.

During the refueling operations a fuel transfer basket is loaded with 16 spent fuel assemblies and is then transported from the north sump, to the fuel transfer tube and down the fuel transfer tube using an overhead crane. Failure of the overhead crane during this operation could be a more severe accident than that assumed by the licensee. Therefore, we analyzed the consequences of this accident assuming that all the pins in 16 fuel assemblies failed. The assumptions and results of our analysis are given in Table 1. The calculated potential doses at the EAB from this accident are 56 Rem thyroid and 0.4 Rem whole body dose. The limiting dose of 56 Rems is within the guidelines of the 10 CFR Part 100 value of 100 Rem. The whole body doses are not controlling due to the decay of the short-lived radioisotopes prior to fuel handling. Since the refueling crane is positioned above the core or between the core and the fuel transfer basket during fuel handling, the fuel transfer basket itself cannot be dropped onto the core and therefore this accident was not considered credible. Analysis of dropping a spent fuel assembly during maneuvers in the spent fuel pool resulted in no calculated fuel pin damage to the dropped or target fuel assemblies.

785 344

7908280 G80

Our conclusions are that: (1) the limiting accident is the drop of the fully loaded transfer basket down the fuel transfer tube and (2) the postulated consequences of the limiting accident are within the guidelines of 10 CFR Part 100 and are, therefore, acceptable.

ENVIRONMENTAL CONSIDERATIONS

The environmental impacts of an accident involving the handling of spent fuel inside containment have been addressed in Section 7.1 of the Final Environmental Statement (FES) dated November 1973, for the operation of Dresden Nuclear Power Station Unit 1.

Date: August 1, 1979

785 345

Table 1

ASSUMPTIONS FOR AND POTENTIAL CONSEQUENCES OF THE POSTULATED  
FUEL HANDLING ACCIDENTS AT THE EXCLUSION AREA BOUNDARY  
FOR DRESDEN STATION UNIT 1

Assumptions:

Guidance in Regulatory  
Guide 1.25

Power Level	700 Mwt
Fuel Exposure Time	3 years
Power Peaking Factor	1.5
Equivalent Number of Assemblies damaged	16
Number of Assemblies in core	464
Charcoal Filters available	None
Decay time before moving fuel	24 hours
0-2 hours X/Q Value, Exclusion Area Boundary (ground level release)	$1.0 \times 10^{-4} \text{ sec/m}^3$

Doses, Rem

	<u>Thyroid</u>	<u>Whole Body</u>
--	----------------	-------------------

Exclusion Area Boundary (EAB) Consequences from Accidents Inside Containment	56	0.4
--	----	-----

785 346