



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

January 31, 1984

MEMORANDUM FOR: Chairman Palladino  
Commissioner Gilinsky  
Commissioner Roberts  
Commissioner Asselstine  
Commissioner Bernthal

FROM: *John E. Zerbe*  
John E. Zerbe, Director  
Office of Policy Evaluation

SUBJECT: REDUCING FUEL ENRICHMENT AND UPGRADING PHYSICAL  
PROTECTION AT NON-POWER REACTORS

As requested at the January 26 agenda planning session, we offer for your consideration in preparation for the planned February 6 discussion the following observations concerning LEU conversion and physical protection upgrading at non-power reactors (NPRs).

Introduction

In light of the State Department spokesman's comment at the January 27 briefing that further action by NRC to reduce enrichment of the fuel in licensed U.S. NPRs would have only a "marginal" impact on the U.S. Government's effort to encourage foreign countries to reduce their NPR fuel enrichments, it appears that further Commission consideration of reducing enrichment at U.S. NPRs should be based primarily on domestic safeguards considerations.

As noted by the DOE spokesman at the briefings, it appears that the use of LEU fuel in NPRs is feasible for most NPRs. Moreover, assuming that funding is available, there appears to be general agreement that substitution of LEU for HEU in NPR fuel would largely resolve the issue of the adequacy of NPR safeguards to prevent the theft of weapons-grade material. However, even if funding were available, there are several additional reasons why a conversion process will take some time. For instance, we understand that conversion would require additional case-specific licensing safety analyses, may be limited by the availability of fuel, and is dependent upon DOE's rate of progress in completing its fuel research program.

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The issue then, it seems to us, is whether safeguards protection at NPRs is adequate in the short run. In this regard, the briefings on January 27 suggest that the HEU fuel now used in NPRs may involve a significant risk of theft in an attempt to produce an explosive. The EDO's memorandum of January 25 suggested further upgrades to Category I and Category II NPR protection that would reduce that risk. In this memorandum, we summarize in broad terms present and proposed rules for Categories I and II NPR fuels to provide a perspective for considering staff's suggested additional requirements. We then offer for your consideration some observations on the requirements and possible alternatives.