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PETITION RULE PRM 51-6

(45 FR 25557)

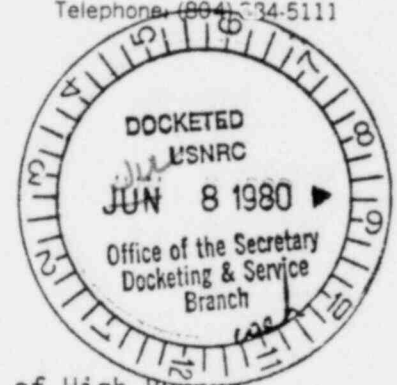
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July 2, 1980



Mr. Samuel J. Chilk
 Secretary of Commission
 United States Nuclear Regulatory Commission
 Washington, DC 20555

- References (1) Petition for Rulemaking on Generic Impacts of High Burnup Nuclear Fuel - April 15, 1980, Fed. Reg.
- (2) Letter from Duke Power to Mr. Samuel J. Chilk, dated June 13, 1980, same subject as above.

Dear Mr. Chilk:

For the reasons presented in the second referenced letter above, the Babcock & Wilcox Company believes that a generic environmental impact statement is not appropriate with regard to the use of high burnup nuclear fuel in commercial nuclear reactors.

With regard to several specific issues in the petition, Babcock & Wilcox submits the following comments.

We believe high burnup nuclear fuel offers significant benefits to the nation and will result in an overall positive impact on the environment thereby negating the need for a generic environmental impact statement.

It is our intent, in the subsequent paragraphs of this letter to identify, discuss and to clarify what we believe are misconceptions expressed in the petition concerning the nuclear fuel cycle, the associated licensing process and the environmental effects associated with high burnup nuclear fuel.

- (1) "...the federal government and the utilities want to use more uranium in existing nuclear fuel in lightwater reactors across the country."

For present high burnup fuel assembly applications the quantity of uranium in the fuel rods is identical to the quantity used in low burnup fuel assemblies. High burnup is simply a more efficient means of extracting energy from the fuel and will lead to the use of less uranium in existing lightwater reactors.

Acknowledged by *[Signature]*

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- (2) "The benefits to the utilities of greater uranium utilization should not be the determining factor in higher burnup approvals."

The best interest of the public is served by improving uranium utilization because one of America's natural resources, uranium, is conserved. It should also be noted that utilities are publicly regulated, therefore improvements in uranium utilization yield lower fuel costs, which translate into lower costs to the consumer.

- (3) "These experiments and others are being conducted without an Environmental Impact Statement, even though they could cause significant and widespread long and short term effects on the human environment."

The petition's discussion of high burnup experiments is both inconsistent and incorrect. The petition states these experiments could cause significant and widespread long and short term effects on the environment, while in the next sentence it is acknowledged that they are fairly limited experiments. In fact, these experiments generally involve less than 5% of the nuclear fuel in the reactor and do not have a significant effect on the core average behavior. It is unclear from the petition how experience with full size fuel assemblies, pointed out as a shortcoming, is to be gained unless these experiments are allowed to proceed.

The petitioner is apparently unfamiliar with the logical and orderly process followed in qualifying and verifying nuclear fuel designs. The basic steps are usually (1) exploratory research in laboratories (2) concept development and refinement for industrial applications (3) verification with small scale tests (typically one to five fuel assemblies) in a reactor environment and (4) full core demonstrations. For high burnup nuclear fuel, the industry is currently conducting verification tests on a limited number of fuel assemblies.

- (4) "Greater fission gas releases from nuclear reactors."

The petition's discussion of fission gas releases ignores the defense-in-depth philosophy followed in nuclear power plant design. There are three primary barriers to the release of radioactive effluents to the environment- the fuel rod cladding, the reactor vessel and primary coolant system, and the reactor containment building. These barriers and their associated systems are designed to minimize radioactive releases during normal operations and under accident conditions. The generation of a greater fission product inventory within the fuel rod does not automatically translate into greater activity releases or greater offsite doses from the nuclear reactor.

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- (5) "Potential for greater radiological impact in reactor and spent fuel pool accidents."

The doses that are calculated for the various reactor accidents analyzed in Chapter 15 of the Safety Analysis Report for a nuclear plant are attributable to short half-life iodine and noble gas nuclides, in particular iodine-131 and xenon-133. The activity of these dose controlling nuclides in any fuel assembly or group of fuel assemblies is essentially independent of fuel burnup. This is due to the fact that the concentration of these nuclides reach equilibrium at very low burnups and remain at their saturated activity level thereafter.

- (6) "Production of inferior grade nuclear spent fuel which can lead to long term environmental hazards."

The petition's references to high burnup fuel's poorer structural characteristics, poorer integrity, and accelerated corrosion have not been substantiated by scientific data. The purpose of the aforementioned "fairly limited experiments" is to provide the fuel performance data for design verification.

- (7) "Increased radioactive releases during reprocessing."

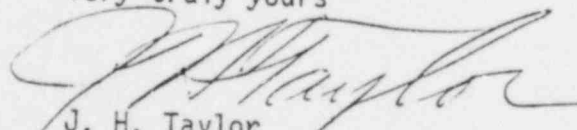
The petitions' discussion of reprocessing is not germane to high burnup."

In conclusion we believe high burnup nuclear fuel actually has the following environmentally beneficial aspects:

1. less uranium ore is required for a given energy output, thereby reducing the mining, processing and transportation of uranium.
2. fewer spent fuel assemblies are utilized thereby resulting in less waste for storage and/or disposal.

We believe that high burnup nuclear fuel offers substantial benefits to the nation and will have a positive effect on the environment resulting in an overall reduction in the dose to the public. Based upon these conclusions we believe that the petition for rulemaking should be denied.

Very truly yours



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Manager, Licensing

JHT/fw

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