NRC PDR

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

AUG 6 1979

Docket No. 50-304

Ms. Catherine Quigg, Research Director
Pollution and Environmental Problems, Inc.
Box 309
Palatine, Illinois 60067

Dear Ms. Quigg:

This letter is sent to acknowledge receipt of your 10 CFR 2.206 petition requesting that the Director of Nuclear Reactor Regulation issue a full Environmental Impact Statement concerning the high burnup fuel project at the Zion 2 reactor.

We regret the delay in answering you, but, as indicated in the telephone conversation with Mr. Richard Bachmann of the NRC legal staff on July 11, we are currently reviewing your comments and appropriate action will be taken within a reasonable time.

Sincerely,

Original Signed by
H. R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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POLLUTION &
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Box 309
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April 27, 1979

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Need for Environmental Impact Statement on Major Federal Action: The Granting of Higher Fuel Burnup Requests

Dear Mr. Denton:

With the decision not to reprocess, the federal government and the utilities want to use more uranium in existing lightwater reactors. To that end, the U.S. Department of Energy (DOE) has initiated cost-shared high burnup projects with Duke Power Co. and Arkansas Power & Light. The DOE is also supporting two pellet clad interaction (p.c.i.) projects with Consumer Power Co. and Commonwealth Edison Co.

On March 7, 1979 the NRC issued a permit to ComEd allowing the irradiation of four Zion spent fuel assemblies to extended burnups in Zion 2, up to about 55,000 MWD/MTU. Zion's Technical Specifications provide for a burnup limit of 38,000 MWD/MTU. The NRC admits there has been no experience with full size fuel assemblies irradiated to these burnups, but nonetheless issued a Negative Declaration stating the higher burnups would have no appreciable environmental impact.

These experiments and others are being conducted without an Environmental Impact Statement, even though they could cause significant long and short term effects on the human environment. According to the NEPA, "major Federal actions significantly affecting the quality of the human environment" require "a detailed Environmental Impact Statement (EIS) by the responsible government official. In accordance with 10 CFR, Part 2 (2.206), please consider this letter my formal request for a full EIS on high burnup fuel, both in the reactor and subsequently as a spent fuel waste.

The following specific comments relate to potential significant effects of high burnup on the human environment and constitute the basis for my request:

1. Greater fission gas releasesfrom nuclear reactors. According to Nuclear Safety, Vol. 19, No. 6, Nov-Dec. 1978: "...comments from the research community indicate growing evidence for an increased rate of fission-gas release in lightwater reactor fuels (LWR), particularly above 30,000 MWD/MTU. Dr. Peter Lang, acting director for LWR Development, Division of Nuclear Power, DOE, also projects greater fission gas releases as a side-effect of higher fuel burnup times.

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In its Safety Evaluation Report on increased fuel burnup at Zion, the NRC concedes that "Irradiating fuel to extended burnups will increase the amount of long-lived fission products and "could increase the fraction of failed fuel in the core over that previously experienced." The NRC states: "Therefore, although the licensee may release more radioactivity from Zion 2 during this extended burnup program than during previous cycles, compliance with plant technical specifications will maintain concentrations of radioactivity within the allowed limits."

In other words, the NRC, without notifying the public of the quantity or kind of increased radioactivity releases from the Station, has decided on our behalf that this increased amount of radioactivity is acceptable to us. The NRC made this decision unilaterally without notifying the public or without benefit of public hearings or input. We call to question the democracy and ethics of this decision-making process.

The public is entitled to know quantitatively and qualitatively the radionuclide emissions attributable to higher burnup, in advance of those releases. The benefits to the utilities of greater uranium utilization should not be the determining factor in higher burnup approvals.

2. Increased fission gas releases from spent fuel pools. Higher irradiation damage to fuel may occur with higher burnup. Dr. Peter Lang states that current LWRs have not experienced excessive corrosion on the outside surface of the fuel rods. He suggests, however, that: "If burnups and residence times are increased significantly, it is possible that a thicker layer of oxide and crud deposits may develop, raising the oxide cladding interface temperature sufficiently to accelerate corrosion."

I submit that the above-state possibility of fuel corrosion raises serious questions regarding the quality of spent fuel produced under higher burnup. If the fuel is more corroded, the radioactive emissions to and from the spent fuel pool and subsequently to the atmosphere and public will be higher.

The public, in the absence of an EIS, is being asked to accept the risk of greater fission gas releases from spent fuel pools in the future -- without even an estimate of the quantity and makeup of these emissions or their effects on the human environment.

3. Production of inferior grade nuclear spent fuel which can lead to long-term environmental hazards. Previous government research, including NUREG-0404, is based on low burnup fuel. It is useless in predicting pool storage behavior of high burnup fuel.

The public is currently being asked to accept greatly increased amounts of spent fuel at the sites of nuclear reactors across the country, often in highly populated areas. The NRC's

NUREG-0404 assures citizens that "At-reactor spent fuel storage can be increased ...with no sacrifice to public health and safety." and "The environmental impact of the proposed increased at-reactor spent fuel storage was negligible ... based on existing pool water technology."

It should be pointed out that existing pool water technology and research is based on low burnup fuel. A.B. Johnson, Jr., in his "Behavior of Spent Nuclear Fuel in Water Pool Storage," notes the maximum burnup of stored commercial fuel is 33,200 MWD/MTU and for military 36,000 MWD/MTU (ECF at Idaho). The NRC's projections for safe storage of spent fuel are thus based on limited low burnup pool storage experience; with no experience beyond 36,000 MWD/MTU including military.

The spent fuel product of the future, if high burnup is permitted on a widescale, is of unknown quality and is anticipated by some scientists to have decidedly poorer structural characteristics and integrity than present low burnup specimens. As the NRC grants permission to more and more utilities to go to higher burnup, the quality of spent fuel will probably be degraded; at best it is unknown.

The low burnup spent fuel storage experience at the Morris Operation and that researched by A.B. Johnson, Jr. of Battelle Laboratory becomes irrelevant as a basis for spent fuel behavior predictions as the United States moves toward higher burnup. I submit that NUREG-0404 should be declared null and void as a document on which to base spent fuel safety and environmental considerations.

Before proceeding with reactor-scale experiments that could endanger their health and environment, the public is entitled to scientific projections and analyses of high burnup. These should include, but not be limited to, risks of premature rod failure, estimations of increased fission gas releases and fuel rod internal pressure, likelihood of corrosion and hydriding of cladding and structural materials and expectations of fuel assembly dimensional and structural changes. We should be given a reasonable explanation of the reasons why the above research can not be carried on in industry and government laboratories, before proceeding with experimentation in the human environment.

4. Potential for greater radiological impact in reactor and spent fuel pool accidents. The projected impact of high burnup on reactor and spent fuel pool accidents has not been revealed to the public. The impact of larger radioactive gas releases from high burnup fuels in a loss of coolant accident either in the reactor or the spent fuel pool should be an important consideration in allowing a utility permission for higher burnup. According to R. O. Meyer, Director of Safety Systems, Office of Nuclear Reactor Regulations, U.S. NRC: "...the NRC

has reason to believe that the plant safety analyses underpredicted fission gas release at high burnups."

The public is entitled to know the corrected estimates for increase in fission gas release due to high burnup; especially since all indications are that fission gas release is a direct function of burnup.

In conclusion, I protest not only the NRC's negative appraisal of the environmental effects of high burnup -- but also the fact that prior public notice of the NRC's action was not given.

My assessment of the environmental impact is at variance with the NRC. I urgently request that you reconsider and prepare a full and comprehensive EIS on high burnup in lightwater reactors in order to better serve the public health and safety.

Sincerely yours,

Catherine Quigg

Catherine Quigg, research director
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Palatine, Illinois 60067

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cc: President Jimmy Carter, and to Messrs. Douglas Costle (Administrator, US-EPA), Jacob Dumelle (Chairman, Ill. Pollution Control Bd.), Joseph Hendrie (Chairman, NRC), Charles Percy (US Senator from Illinois), Adlai Stevenson (US Senator from Illinois), James Schlesinger, (Secretary, DOE), William Scott (Attorney Gen. of Ill.), Philip Crane (US Congressman from Ill.), James Thompson (Gov. of Ill.), and Charles Warren (Chairman, President's Council on Environmental Quality)