

Docket 4.

APR 27 1973

Docket No. 50-155

Maurice S. Reizen, M. D., Director  
Michigan Department of Public Health  
State of Michigan  
3500 North Logan  
Lansing, Michigan 48914

Dear Dr. Reizen:

Your letter of March 16, 1973 to Chairman Ray concerning partial enrichment of the Big Rock fuel rods with recycle plutonium instead of uranium 235 as described in Change No. 34 and Amendment No. 4 (dated December 6, 1972) to Facility Operating License No. DPR-6, has been referred to me for reply.

Your letter questioned our conclusion that Amendment No. 4 does not involve significant hazard considerations different from those previously evaluated because "there is uncertainty among scientists" and because the amendment permits an increase in plutonium inventory from 50 to 150 kilograms and constitutes the first licensure for significant plutonium fuel usage in commercial reactors". As you are no doubt aware, these particular issues are now the subject matter of litigation in the case of West Michigan Environmental Action Council v. AEC, et al., Docket No. G 58-73, in the U. S. District Court for the Western District of Michigan. While this view appears to be held by some scientists, it is not the view of the regulatory staff of the Atomic Energy Commission. For your information however, we are enclosing a copy of the December 6, 1972 staff memorandum which documents the finding of no significant hazards considerations different from those previously evaluated.

Your letter requested that "a new license be required for the operation of this plant with plutonium fuel which will necessitate a complete health, safety, and environmental criteria review". Your request is "based upon health and safety issues for persons offsite in the event of incident". For this use of plutonium fuel, a completely new license is not required by the Commission's regulations. Rather an amendment to such license is considered the appropriate manner in which to account for the change to this plutonium fuel and, accordingly, an amendment to DPR-6 was issued to authorize such use. Because of the public interest which has been

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Copy sent to [unclear]

Maurice S. Reizen, M. D.

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shown concerning this amendment, the Commission has offered an opportunity for hearing on the amendment. A copy of that notice, published in the Federal Register on April 10, 1973 (38 F.R. 9104), is enclosed for your information and guidance, should you desire to participate in the proceedings. In the event that you desire to so participate it is incumbent that you comply with the requirements set forth therein and the Commission's Regulations, 10 CFR Part 2, in particular 10 CFR Section 2.714, a copy of which is enclosed.

In regard to the broader question concerning the use of plutonium fuel, you may be interested in our plans to prepare a generic environmental survey concerning the plutonium fuel cycle. These plans were discussed in our recent testimony regarding the Uranium Fuel Cycle before an Atomic Safety and Licensing Board. The specific reference is pages 130-136 of Docket RM-50-3 on Thursday, February 1, 1973, copy enclosed. We expect to complete the plutonium fuel cycle statement and hold a hearing in 1974. In this respect it may be of interest to you that we have been advised, in conversations with the Consumers Power Company, that Consumers does not plan to operate Big Rock with a core containing more than 50 kilograms of plutonium recycle fuel until after 1974.

If we can be of further assistance, please let us know.

Sincerely,

Original signed by  
Roger S. Boyd

A. Giambusso, Deputy Director  
for Reactor Projects  
Directorate of Licensing

*This Ltr. also dictated  
to Don Van Falowen of  
Dr. Reizen's office at  
4 p.m. on 4/27/73, for  
and to only to be checked  
again to Dr. Reizen at  
4:50 on 4/27/73. RD*

Enclosures:

1. Memo dated 12/6/72
2. Notice
3. Transcript RM-50-3, pp. 130-136
4. 10 CFR §2.714

Distribution

Chairman Ray (2) RP Reading  
Commissioner Ramey Branch Reading  
Commissioner Larson JFO'Leary, L  
Commissioner Doub HShapar, OGC  
Docket File AGiambusso, L:RP  
AEC PDR Gertter, DRA (#5448)  
L Reading MGroff, DRA

*Sent Special Delivery  
by dropping in Register  
5:00 p.m. at 4:50  
on 4/27/73*

MHoffman, OGC (G-town)  
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DJSkovholt, L:OR  
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DLZiemann, L:ORB2  
JJShea, L:ORB2  
RMDiggs, L:ORB2

SEE ATTACHED YELLOWS  
FOR CONCURRENCES:

OFFICE	L:ORB #2	OGC	L:OR	L:RP	OGC-Gt
SURNAME	X7403 JJShea	TFEngelhardt LChandler:db	DJSkovholt	AGiambusso	JFO'Leary
DATE	4/26/73	4/26/73	4/26/73	4/26/73	4/27/73

rm AEC-318 (Rev. 9-53) AECM 0240

442-16-81465-1 645-078

per LChandler  
OGC-Gt

Docket No. 50-155

Maurice S. Reizen, M. D., Director  
Michigan Department of Public Health  
State of Michigan  
3500 North Logan  
Lansing, Michigan 48914

Dear Dr. Reizen:

We have reviewed your letter to Dr. Ray (dated March 16, 1973) concerning partial enrichment of the Big Rock Point fuel rods with recycle plutonium instead of uranium 235 as described in Change No. 34 and Amendment No. 4 (dated December 6, 1972) to Facility Operating License No. DPR-6.

Your letter questioned our conclusion that Amendment No. 4 does not involve significant hazard considerations different from those previously evaluated because "there is uncertainty among scientists" and because "the amendment permits an increase in plutonium inventory from 50 to 150 kilograms and constitutes the first licensure for significant plutonium fuel usage in commercial reactors". As you are no doubt aware, these particular issues are now the subject matter of litigation in the case of West Michigan Environmental Action Council v. AEC, et al., Docket No. G 58-73, in the U. S. District Court for the Western District of Michigan. In view of this litigation, it would be inappropriate for us to discuss these allegations in detail at this time. For your information, however, we are enclosing a copy of the December 6, 1972 memorandum of James J. Shea which documents our finding of no significant hazards considerations different from those previously evaluated.

Your letter requested that "a new license be required for the operation of this plant with plutonium fuel which will necessitate a complete health, safety, and environmental criteria review". Your request is "based upon health and safety issues for persons offsite in event of incident". For this use of plutonium fuel, a completely new license was not required, rather an amendment to DPR-6 was issued to authorize such use. Because of the public interest which has been shown concerning

3. The restrictions on the amount of plutonium enrichment result in a maximum plutonium inventory accumulation in the core that is approximately three to four times the plutonium inventory resulting from the production of plutonium from irradiation of uranium 238 during reactor operation with U-235 enriched fuel only. The change in fission product inventory resulting from the fissioning of recycled plutonium and the noted increase in the plutonium inventory do not cause significant changes to the calculated radiation dose rates during normal or accident conditions. The recognized small increase in I-131 production is partially offset by the expected improvement in clad integrity. The fission products released to the atmosphere during normal operation via the primary coolant and air ejector will be restricted by the limits specified in the AEC approved Technical Specifications that have been in use for the past decade at Big Rock Point.

It should be noted that plant modifications to be completed during the 1974 outage are expected to result in full conformance to the AEC Interim Acceptance Criteria for Emergency Core Cooling Systems for the new Reload G fuel bundles.

Your letter stated that in your opinion the use of plutonium enrichment in the manner and quantities authorized for Big Rock Point could change the public health and safety criteria for normal operation and materially increase the potential public hazard in event of an incident because "plutonium fuel is more toxic than the conventional uranium core composition and its physical properties make it one of the most difficult elements to control".

Plutonium is produced in all uranium-fueled reactors and has been considered in the safety evaluations of these reactors. Under normal operating conditions, the plutonium oxide is confined within the zircaloy cladding. To date there is no evidence in any of the operating power reactors of excessive levels of uranium oxide or plutonium oxide having escaped into the primary coolant system even though measurable quantities of fission gases have been released from some fuel rods with defective cladding. In addition to the safety considerations, escape of significant quantities of uranium or plutonium into the coolant could not be tolerated for the practical reason that cleanup costs to permit routine maintenance and surveillance would be excessive. During normal operation with plutonium enriched fuel, it is impossible for the plutonium to become airborne. When the

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Maurice S. Reizen, M. D.

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full conversion of the Big Rock Point core to the plutonium oxide bearing fuel is completed (some time after 1978), the core will contain no more than 300 pounds of plutonium isotopes compared with about 25,000 pounds of uranium. In the dilute oxide form to be used in the Big Rock Point core, temperatures well in excess of the fuel melting temperature of about 5000°F would be required to cause noticeable vaporization of plutonium oxide.

We have determined that for the most extreme low probability design basis accident, the release of plutonium to the atmosphere is acceptably within 10 CFR 100 guidelines, and the fission products released from the plutonium enriched core continue to be the limiting factors in assessing the potential risk of radiation exposure to the public.

Your letter stated that "the Hazards Summary Report did not consider the use of plutonium fuel and an environmental impact statement has not been submitted for the operation of the Big Rock Point plant".

The Big Rock Point reactor has been operating for more than ten years in accord with Technical Specifications issued by the AEC that include limits on radioactivity released to the environment that satisfy the requirements of 10 CFR 20. The basis for the technical specifications limits on radioactive releases to the atmosphere were derived from the Big Rock Point Hazards Summary Report which included consideration of the effects of all radionuclides present, including plutonium. Although not labeled "Environmental Impact Statement", our evaluation did encompass such consideration for the site as it exists today with an installed, licensed nuclear power plant.

The change from a current plutonium inventory of about 88 pounds to an inventory of about 300 pounds of plutonium isotopes over a four-year period does not significantly change the calculated radiation doses to the public in the event of an accident. Release of fission products remains the limiting factor in assessing the accident radiation hazards to the public.

Your letter requested that "a new license be required for the operation of this plant with plutonium fuel which will necessitate a complete health, safety, and environmental criteria review". Your request is "based upon health and safety issues for persons offsite in event of incident".

Maurice S. Reizen, M. D.

- 4 -

The license has been changed by Amendment No. 4 to Facility License No. DPR-6, based on our evaluation, to authorize an increase from 50 kilograms to 150 kilograms in the amount of plutonium that can be received, possessed, and used in connection with operation of the Big Rock Point facility. Our evaluation of this change considered the health, safety, and environmental considerations associated with the increased plutonium authorization. There is no evident justification to review all other (non-plutonium related) aspects of reactor operation. We have, in effect, accomplished by a change to the license what you suggest accomplishing by issuing a new license.

Sincerely,

A. Giambusso, Deputy Director  
for Reactor Projects  
Directorate of Licensing

Distribution

Chairman Ray (2)  
Commissioner Ramey  
Commissioner Larson  
Commissioner Doub

~~Chairman~~  
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AEC PDR  
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RP Reading  
Branch Reading  
JFO'Leary, L  
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SURNAME ▶	3/29/73	3/30/73				
DATE ▶						

Docket No. 50-155

Maurice S. Reizen, M. D., Director  
Michigan Department of Public Health  
State of Michigan  
3500 North Logan  
Lansing, Michigan 48914

Dear Dr. Reizen:

We have reviewed your letter to Dr. Ray (dated March 16, 1973) concerning partial enrichment of about 20% of the Big Rock Point fuel rods with recycle plutonium instead of uranium 235 that has been used in all of the fuel rods of approved reload fuel bundles prior to authorization of Change No. 34 and Amendment No. 4 (dated December 6, 1972) to Facility Operating License No. DPR-6.

Your letter questioned our conclusion that Amendment No. 4 does not involve significant hazard considerations different from those previously evaluated because "there is uncertainty among scientists" and because "the amendment permits an increase in plutonium inventory from 50 to 150 kilograms and constitutes the first licensure for significant plutonium fuel usage in commercial reactors".

The bases for the AEC conclusion that there are no significant hazard considerations different from those previously evaluated are:

1. The Reload G fuel bundle containing an 11 x 11 fuel rod configuration instead of the 9 x 9 fuel rod array in current use results in reduced fuel temperatures during normal and accident conditions. The reduced fuel temperatures, in addition to other design and fabrication improvements of the fuel pellets, will enhance fuel rod clad integrity; i.e., reduce further the potential for leakage of fission products from the fuel into the coolant.
2. The limit of 24 plutonium enriched rods per bundle positioned around the unpowered center rod prevents significant neutronic changes or uncertainties that could affect predicted core behavior or reduce the dynamic safety margins.

this amendment, the Commission has offered an opportunity for hearing on the amendment and has designated an Atomic Safety and Licensing Board to receive and rule on requests for such a hearing and/or petitions for intervention in such a hearing. A copy of that notice, published in the Federal Register on April 10, 1973 (38 F.R. 9104), is enclosed for your information and guidance, should you desire to participate in the further proceedings.

With regard to the broader question concerning the use of plutonium fuel, you may be interested in our plans to prepare a generic fuel cycle statement for plutonium fuel. These plans were discussed in our recent testimony regarding the Uranium Fuel Cycle before an Atomic Safety and Licensing Board. The specific reference is pages 130-136 of Docket RM-50-3 on Thursday, February 1, 1973. We expect to complete the plutonium fuel cycle statement and hold a hearing in 1974. Although the precise dates for the statement and hearing have not yet been established, we have been advised, in conversations with your staff and with the Consumers Power Company, that Consumers does not plan to operate Big Rock with a core containing more than 50 kilograms of plutonium recycle fuel until after 1974.

If we can be of further assistance, please let us know.

Sincerely,

A. Giambusso, Deputy Director  
for Reactor Projects  
Directorate of Licensing

Enclosures:

1. Memo fm JJShea dtd 12/5/72
2. Notice
3. 10 CFR Part 2

Distribution

Chairman Ray (2)  
Commissioner Ramey  
Commissioner Larson  
Commissioner Doub  
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DLZiemann, L:ORB2  
JJShea, L:ORB2  
RMDiggs, L:ORB2  
JHendrie, L:TA  
SSmiley, L:FM  
SEE ATTACHED  
YELLOW FOR CON-  
CURRENCES:

OFFICE ▶	L:ORB #2884	OGC	L:OR	L:RP	L
SURNAME ▶	X7403 JJShea:sjh	CHANDLER	DJSkovholt	AGiambusso	JFO'Leary
DATE ▶	4/20/73	4/23/73	4/ /73	4/ /73	4/ /73



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Your letter questioned our conclusion that Amendment No. 4 does not involve significant hazard considerations different from those previously evaluated because "there is uncertainty among scientists" and because "the amendment permits an increase in plutonium inventory from 50 to 150 kilograms and constitutes the first licensure for significant plutonium fuel usage in commercial reactors". As you are no doubt aware, these particular issues are now the subject matter of litigation in the case of West Michigan Environmental Action Council v. AEC, et al., Docket No. G 58-73, in the U. S. District Court for the Western District of Michigan. In view of this litigation, it would be inappropriate for us to discuss these allegations in detail at this time. For your information, however, we are enclosing a copy of the December 6, 1972 memorandum of James J. Shea which documents the finding of no significant hazards considerations different from those previously evaluated.

Your letter requested that "a new license be required for the operation of this plant with plutonium fuel which will necessitate a complete health, safety, and environmental criteria review". Your request is "based upon health and safety issues for persons offsite in event of incident". The statutory framework of the AEC provides for amendment of licenses, rather than issuance of new licenses, when changes

Maurice S. Reizen, M. D.

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in operation are proposed. That course was followed with the issuance of Amendment No. 4 to Facility Operating License No. DPR-6. Because of the public interest which has been shown concerning this amendment, the Commission has offered an opportunity for hearing on the amendment and has designated an Atomic Safety and Licensing Board to receive and rule on requests for such a hearing and/or petitions for intervention in such a hearing. A copy of that notice, published in the Federal Register on April 10, 1973 (38 F.R. 9104), is enclosed for your information and guidance, should you desire to participate in the further proceedings.

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for Reactor Projects  
Directorate of Licensing

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TJCarter, L:OR

DLZiemann, L:ORB #2  
JJShea, L:ORB #2  
RMDiggs, L:ORB #2  
JMHendrie, L:TR

See  
Attached  
yellow

OFFICE ▶	L:ORB #2	L:ORB #2	L:TR	OGC	L:OR	L:RP
X7403	JJShea:sjh	DPZ	JMHendrie		DJSkovholt	AGiambusso
SURNAME ▶	RMDiggs	DLZiemann	JMHendrie		DJSkovholt	AGiambusso
DATE ▶	4/12/73	4/17/73	4/ /73	4/ /73	4/ /73	4/ /73

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It should be noted that plant modifications to be completed during the 1974 outage are expected to result in full conformance to the AEC Interim Acceptance Criteria for Emergency Core Cooling Systems for the new Reload G fuel bundles.

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full conversion of the Big Rock Point core to the plutonium oxide bearing fuel is completed (some time after 1978), the core will contain no more than 300 pounds of plutonium isotopes compared with about 25,000 pounds of uranium. In the dilute oxide form to be used in the Big Rock Point core, temperatures well in excess of the fuel melting temperature of about 5000°F would be required to cause noticeable vaporization of plutonium oxide.

We have determined that for the most extreme low probability design basis accident, the release of plutonium to the atmosphere is acceptably within 10 CFR 100 guidelines, and the fission products released from the plutonium enriched core continue to be the limiting factors in assessing the potential risk of radiation exposure to the public.

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OFFICE OF THE CHAIRMAN

TO: *Key*

REPLY FOR \_\_\_\_\_'s SIGNATURE

REPLY FOR SIGNATURE BY: GM \_\_\_\_\_ DR \_\_\_\_\_

FOR APPROPRIATE HANDLING

FOR INFORMATION: GM \_\_\_\_\_ DR \_\_\_\_\_ COMMISSIONERS \_\_\_\_\_

REMARKS:

*Coordinate with Mr. Hoffman*

A. W. JACKSON  
For the Chairman

PLEASE SEND TWO COPIES OF REPLY TO OFFICE OF THE CHAIRMAN