

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
POWER AUTHORITY OF THE STATE OF NEW YORK)	Docket No. 50-286
(Indian Point Nuclear Generating)	
Unit No. 3))	

EXEMPTION

I.

The Power Authority of the State of New York (the licensee) is the holder of Facility Operating License No. DPR-64, which authorizes operation of the Indian Point Nuclear Generating Unit No. 3. The license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

The facility consists of a pressurized water reactor at the licensee's site located in Westchester County, New York.

II.

By letter dated January 8, 1992, as supplemented February 26, 1992, the licensee requested an amendment to the Technical Specifications that would allow the use of fuel clad with ZIRLO, a zirconium alloy similar to Zircaloy. Currently, the Technical Specifications allow only the use of Zircaloy clad fuel. In addition, the licensee's letter requested exemptions from several Code of Federal Regulations (CFR) requirements since specific reference is made to only Zircaloy clad fuel in the CFR requirements.

9205200294 920506
PDR ADOCK 05000286
P PDR

III.

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to public health and safety, and are consistent with the common defense and security and (2) when special circumstances are present. According to 10 CFR 50.12(a)(2)(ii), special circumstances are present when "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule...."

The Code of Federal Regulations at 10 CFR 50.46 states: "Each boiling and pressurized light-water nuclear power reactor fueled with uranium oxide pellets within cylindrical Zircaloy cladding must be provided with an emergency core cooling system (ECCS) that must be designed such that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in paragraph (b) of this section. ECCS cooling performance must be calculated in accordance with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated." The Code of Federal Regulations at 10 CFR 50.46 then goes on to give specifications for peak cladding temperature, maximum cladding oxidation, maximum hydrogen generation, coolable geometry, and long term cooling. Since 10 CFR 50.46 specifically refers to

fuel with Zircaloy cladding, the use of fuel with ZIRLO cladding would, in effect, place the licensee outside the applicability of this section of the Code.

The underlying purpose of the rule is to ensure that facilities have adequate acceptance criteria for ECCS. The effectiveness of the ECCS will not be affected by a change from Zircaloy to ZIRLO cladding. The licensee and its contractor have performed calculations that demonstrate the adequacy of this ECCS for a ZIRLO core; therefore, due to the similarities in the material properties of Zircaloy and ZIRLO, the acceptability criteria for ECCS applied to reactors fueled with Zircaloy clad fuel are also applicable to the ECCS for the Indian Point Nuclear Generating Unit No. 3 reactor fueled with ZIRLO clad fuel. An evaluation of the acceptability of ZIRLO clad fuel may be found in the staff's safety evaluation of Topical Report WCAP-12610, "Vantage+ Fuel Assembly Reference Core Report," dated July 1, 1991, and supplemented October 9, 1991. Strict interpretation of the regulation would render the criteria of 10 CFR 50.46 inapplicable to ZIRLO, even though analysis shows that applying the Zircaloy criteria to ZIRLO fuel yields acceptable results. Application of the regulation in this instance would not meet the underlying purpose of the rule; therefore, special circumstances exist. The Commission, based on a request from the licensee, has taken under consideration an exemption from 10 CFR 50.46(a)(1)(i) that would allow the licensee to apply the acceptance criteria of 10 CFR 50.46 to a reactor powered by ZIRLO clad fuel.

The Code of Federal Regulations at 10 CFR 50.44 provides requirements for control of hydrogen gas generated in part by Zircaloy clad fuel after a postulated loss-of-coolant-accident (LOCA). The intent of this rule is clearly to ensure that there is an adequate means of controlling generated hydrogen. The hydrogen produced in a post-LOCA scenario comes from a metal-water reaction. Metal-water reaction rate, as determined by applying the Baker-Just equation has been shown to be conservative for ZIRLO clad fuel; therefore, the amount of hydrogen generated by metal-water reaction in a ZIRLO core will be within the design basis. An evaluation of the acceptability of ZIRLO clad fuel is contained in the staff's safety evaluation of Topical Report WCAP-12610, "Vantage+ Fuel Assembly Reference Core Report," dated July 1, 1991, and supplemented October 9, 1991. A strict interpretation of the rule in this instance would result in the criteria of 10 CFR 50.44 being inapplicable to ZIRLO. Since application of the regulation is not necessary to meet the underlying purpose of the rule, special circumstances exist. The Commission, based on a request from the licensee, has taken under consideration an exemption to 10 CFR 50.44 to a reactor powered by ZIRLO clad fuel.

Paragraph I.A.5 of Appendix K to 10 CFR Part 50 states that the rates of energy release, hydrogen generation, and cladding oxidation from the metal-water reaction shall be calculated using the Baker-Just equation. The Baker-Just equation presumes the use of Zircaloy clad fuel. The intent of this part of the Appendix, however, is to apply an equation that conservatively bounds

all post-LOCA scenarios. Due to the similarities in the composition of ZIRLO and Zircaloy, the application of the Baker-Just equation in the analysis of ZIRLO clad fuel will conservatively bound all post-LOCA scenarios. A complete evaluation of the acceptability of ZIRLO clad fuel is contained in the staff's safety evaluation of Topical Report WCAP-12610, "Vantage+ Fuel Assembly Reference Core Report," dated July 1, 1991, and supplemented October 9, 1991. Since the use of the Baker-Just equation presupposes Zircaloy cladding, and since failure to apply Baker-Just would defeat the purpose of Paragraph I.A.5 of Appendix K given that post-LOCA scenarios will be conservatively bounded, special circumstances exist. The Commission, based on a request from the licensee, is considering an exemption from Paragraph I.A.5 of Appendix K to 10 CFR Part 50 that would allow the licensee to apply the Baker-Just equation to a ZIRLO clad fuel.

IV.

Accordingly, the Commission has determined, pursuant to 10 CFR 50.12, that exemptions as described in Section III are authorized by law, will not endanger life or property, and are otherwise in the public interest; it has also determined that special circumstances exist pursuant to 10 CFR 50.12(a)(2)(ii). Therefore, the Commission hereby grants the following exemptions:

- (1) The Power Authority of the State of New York is exempt from the requirement of 10 CFR 50.46(a)(1)(i) in that the acceptance

criteria for emergency core cooling systems given in 10 CFR 50.46 for reactors using Zircaloy clad fuel may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.

- (2) The Power Authority at the State of New York is exempt from the requirements of 10 CFR 50.44(a) in that the requirements for hydrogen gas control given in 10 CFR 50.44 for reactors using Zircaloy clad fuel may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.
- (3) The Power Authority of the State of New York is exempt from the requirements of Paragraph I.A.5 of Appendix K to 10 CFR Part 50 in that the Baker-Just equation, which presumes the use of Zircaloy clad fuel, may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of these exemptions will have no significant impact on the quality of the human environment (57 FR 17933).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Steven A. Varga, Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 6th day of May 1992

criteria for emergency core cooling systems given in 10 CFR 50.46 for reactors using Zircaloy clad fuel may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.

- (2) The Power Authority at the State of New York is exempt from the requirements of 10 CFR 50.44(a) in that the requirements for hydrogen gas control given in 10 CFR 50.44 for reactors using Zircaloy clad fuel may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.
- (3) The Power Authority of the State of New York is exempt from the requirements of Paragraph I.A.5 of Appendix K to 10 CFR Part 50 in that the Baker-Just equation, which presumes the use of Zircaloy clad fuel, may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of these exemptions will have no significant impact on the quality of the human environment (57 FR 17933).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION
 Original Signed By
 Steven A. Varga, Director
 Division of Reactor Projects - I/II
 Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
 this 6 day of May 1992

OFFICE	PDI-1	PDI-1	SRXB	SPLB	OGC
NAME	CSVogan CW	NConicella:pc	RJones*	CMcCracken*	*
DATE	04/30/92	02/ /92	02/ /92	02/ /92	02/ /92
OFFICE	PDI-1 RoE	AD:RI <i>NA</i>	D:DRPE		
NAME	RACapra	JACalvo:pc	SAVarga		
DATE	05/4/92	05/5/92	05/ /92	/ /	/ /

criteria for emergency core cooling systems given in 10 CFR 50.46 for reactors using Zircaloy clad fuel may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.

- (2) The Power Authority at the State of New York is exempt from the requirements of 10 CFR 50.44(a) in that the requirements for hydrogen gas control given in 10 CFR 50.44 for reactors using Zircaloy clad fuel may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.
- (3) The Power Authority of the State of New York is exempt from the requirements of Paragraph I.A.5 of Appendix K to 10 CFR Part 50 in that the Baker-Just equation, which presumes the use of Zircaloy clad fuel, may also be applied to the Indian Point Nuclear Generating Unit No. 3 reactor using ZIRLO clad fuel.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of these exemptions will have no significant impact on the quality of the human environment (57 FR 17933).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
 Division of Reactor Projects - I/II
 Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
 this day of 1992

OFFICE	PDI-1	PDI-1	SRXB	SPLB	OGC
NAME	CSVogan	NConicella:pc	RJones	CMcCracken	Miyobara
DATE	03/12/92	03/12/92	03/16/92	03/16/92	03/20/92
OFFICE	PDI-1	AD:RI	D:DRPE		
NAME	RACapra	JACalvo:pc	SAVarga		
DATE	04/21/92	04/ /92	04/ /92	/ /	/ /

May 6, 1992

Mr. Ralph E. Beedle
 Executive Vice President, Nuclear
 Generation
 Power Authority of the State of
 New York
 123 Main Street
 White Plains, New York 10601

Dear Mr. Beedle:

SUBJECT: EXEMPTIONS FROM 10 CFR 50.46(a)(1)(i), 10 CFR 50.44(a), AND
 APPENDIX K TO 10 CFR PART 50 - INDIAN POINT NUCLEAR GENERATING
 UNIT NO. 3 (TAC NO. M82567)

By letter dated January 8, 1992, as supplemented February 26, 1992, you requested an amendment to the Technical Specifications (TS) and exemptions to several Code of Federal Regulations (CFR) requirements for the Indian Point Nuclear Generating Unit No. 3. The amendment and the exemptions are needed to allow use of ZIRLO™ clad fuel in the reactor instead of Zircaloy clad fuel as specified in the TS and CFR. You intend on refueling with ZIRLO™ clad fuel during the Cycle 8/9 refueling outage in June 1992.

The Commission has issued an exemption from the requirements of 10 CFR 50.46(a)(1)(i), 10 CFR 50.44(a), and Appendix K to 10 CFR Part 50, regarding the use of ZIRLO™ clad fuel. The exemptions are necessary before the staff can issue the TS amendment you requested. Please note that the TS amendment you requested in your letter of January 8, 1992, as supplemented February 26, 1992, must be issued before the ZIRLO™ clad fuel can be loaded into the Indian Point Nuclear Generating Unit No. 3 reactor.

A copy of the enclosed Exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Original Signed By
 Robert A. Capra, Director
 Project Directorate I-1
 Division of Reactor Projects - I/II
 Office of Nuclear Reactor Regulation

Enclosure:
 Exemption
 cc w/enclosure:
 See next page

OFFICE	PDI-1	PDI-1	SRXB	SPLB	OGC
NAME	CSVogan	NFConicella	RJones	CMcCracken	MYoung
DATE	03/12/92	03/12/92	03/16/92	03/16/92	03/20/92

OFFICE	PDI-1	AD:RI	D:DRPE		
NAME	RACapra	JACalvo	SAVarga		
DATE	03/21/92	03/15/92	03/15/92	/ /	/ /

DATED: May 6, 1992

DISTRIBUTION:

Docket File
NRC & Local PDRs
PD# I-1 Reading
TMurley/TMiraglia
JPartlow
CRossi
JLieberman
SVarga
JCalvo
RCapra
CVogan
NConicella
OGC
EJordan
GHill (4)
ACRS (10)
OPA
OC/LFMB
Plant File
RLobel, 17G21
CMcCracken, 8D1
RJones, 8E23

cc: Plant Service List