



**Entergy
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2CAN113015

U. S. Nuclear Regulatory Commission
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Washington, D. C. 20555

SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Emergency Amendment Change Request
60 MWD/Kg Rod Average Fuel Burnup

Gentlemen:

On July 20, 1989 (2CAN078907), Combustion Engineering Topical Report CEN-386-P was submitted on Arkansas Nuclear One, Unit 2 (ANO-2) docket in support of raising the peak fuel pin burnup limit to 60 megawatt-days/kilogram (MWD/Kg) for 16x16 fuel. ANO-2 began transitioning to an 18-month fuel cycle in 1985. ANO-2, now in Cycle 8, the third full 18-month cycle, has accumulated approximately 332 effective full power days (EFPDs) to date. Physics codes predict that the current fuel pin limit of 52 MWD/Kg, as generically approved in the October 10, 1985, Safety Evaluation Report for Calvert Cliffs Nuclear Power Plant, will be exceeded at approximately 340 EFPD. Entergy Operations has been in contact with the NRC staff and has closely monitored the staff review since the original submittal. Final technical questions were addressed in our letters of May 5, 1990 (2CAN059004), and September 7, 1990 (2CAN099004).

From discussions with the ANO-2 NRR Project Manager on November 15, 1990, we understand that the Safety Evaluation Report (SER) associated with the extended burnup Topical Report is complete. However, the NRC staff has requested a license amendment to facilitate issuance of the SER. Because ANO-2 is currently operating at 100% power, the SER must be issued by November 28, 1990, to avoid exceeding the currently approved burnup limit. Therefore the license amendment must be processed under the provisions of an emergency amendment request in accordance with 10CFR50.91(a)(5). Accordingly, attached is a proposed license amendment. Per 10CFR50.91(a)(1), Entergy Operations has evaluated the proposed change using the criteria in 10CFR50.92(c) and applicable NRC guidance and has determined that the requested change involves no significant hazards consideration. This evaluation is attached.

Very truly yours,

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AFFIRMATION

I, N. S. Carns, being duly sworn, subscribe to and say that I am Vice President, Operations ANO for Entergy Operations, Inc.; that I have full authority to execute this affirmation; that I have read the document numbered 2CAN119015 and know the contents thereof; and that to the best of my knowledge, information and belief, the statements in it are true.

N. S. Carns

N. S. Carns

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named, this 21st day of November, 1990.

Larry Lichenmeyer
Notary Public

My Commission Expires:

May 11, 2000

Proposed Change

This amendment would add the following License Condition.

- 2.C.9 Rod Average Fuel Burnup - Entergy Operations is authorized to operate the facility with an individual rod average fuel burnup (burnup averaged over the length of a fuel rod) not to exceed 60 megawatt-days/kilogram of uranium.

Background

On July 20, 1989 (2CAN078907), Arkansas Power and Light submitted for NRC review CEN-386-P, "Verification of the Acceptability of a 1-Pin Burnup Limit of 60 MWD/Kg for Combustion Engineering 16x16 PWR Fuel." This report was submitted in support of ANO-2 Cycle 8 operation.

Beginning in 1985, Arkansas Power and Light Company initiated the transition of Unit 2 to an 18 month fuel cycle. The Unit is now in cycle 8, the third full 18 month cycle. At approximately 340 Effective Full Power Days (EFPDs), the previously approved maximum fuel rod burnup of 52 MWD/Kg will be exceeded. With continued operation at 100% power, this level will be reached on November 29, 1990.

Previous extended burnup reports have been reviewed and approved by the NRC without an accompanying license amendment. However, it is our understanding from discussions with the ANO-2 NRR Project Manager on November 15, 1990, that approval of ANO-2's use of this Topical Report will require the issuance of an associated license amendment. Since Entergy Operations was only recently made aware of this position and, given the need for approval by November 28, 1990, an emergency change request is required pursuant to 10CFR50.51(a)(5).

Discussion

The technical justification for rod average burnups up to 60 MWD/Kg was provided in Combustion Engineering Topical Report CEN-386-P submitted on July 20, 1989, in Entergy's letter 2CAN078907. This Topical Report documented the methods to be employed to analyze fuel pin and assembly performance for fuel rod average burnup up to 60 MWD/Kg. NRC questions on this report were addressed in Entergy's letters of May 5, 1990 and September 7, 1990.

Emergency Circumstances

The following addresses the emergency nature of this amendment request. To summarize, the requested changes constitutes an emergency situation pursuant to 10CFR50.91(a)(5) because: (1) absent NRC action by November 28, 1990, ANO-2 must be shutdown; (2) this emergency situation could not have been avoided by Entergy Operations; and (3) the proposed change does not involve a significant hazards consideration.

1. Current Condition

ANO-2 currently is operating at 100 percent power in Cycle 8 and has accumulated approximately 332 effective full power days (EFPDs) as of November 21, 1990. Entergy Operations has calculated that at approximately 340 EFPDs, currently estimated to occur on November 29, 1990, continued operation of ANO-2 will be precluded because the facility will reach the rod average fuel burnup limit of 52 MWD/Kg. The current condition of the facility cannot be rectified absent the proposed change to the license or plant shutdown and refueling (not presently scheduled until February 1991).

2. Time Constraints

The NRC first requested that a license amendment be submitted by Entergy Operations on November 15, 1990. Because the change proposed in this submittal must be reviewed and approved by the NRC prior to November 29, 1990, the 30 day notice and comment provisions of 10CFR50.91(a)(2) cannot be met. Accordingly, Entergy Operations has developed this request for issuance of a license amendment pursuant to the emergency provisions of 10CFR50.91(a)(5). This request has been submitted in a timely manner considering the need to develop a significant hazards evaluation and the need to support the emergency request.

Moreover, Entergy Operations initially had requested NRC review and approval of the methodology to evaluate an increase to the ANO-2 fuel pin burnup limit on July 20, 1989. Since that submittal, Entergy Operations maintained active communication with the NRC to monitor the staff review of the request (see Entergy Operations letters to the staff in May and September, 1990 to address specific NRC technical questions). Not until the NRC staff requested a license amendment on November 15, 1990, was there an indication of the need for such an amendment. Therefore, Entergy Operations has acted in a timely fashion with this submittal which provides the NRC staff with adequate time to process an emergency change in accordance with 10CFR50.91(a)(5).

3. Hardship Absent Relief

Without NRC approval of this emergency request, ANO-2 must shutdown and either await completion of the standard license amendment process, or change the fuel in the facility to permit continued operation. These options present hardships to Entergy Operations which are outweighed by the approval of the emergency request, especially considering the absence of a significant hazards associated with the proposed change. In particular, each day ANO-2 would be shutdown, Entergy Operations would incur significant replacement energy costs.

4. Additional Measures

Because this license amendment would explicitly authorize operation with fuel burnup up to 60 MWD/Kg, and there is not currently a license condition that would be exceeded, Entergy Operations need not provide compensatory measure for the period this amendment is in place.

5. Plan for Compliance

ANO-2 is currently in compliance with the applicable requirements of the operating license and Technical Specifications and will continue to maintain compliance with these and any other requirements. With the approval of the proposed change, continued operation of ANO-2 beyond 340 EFPDs will be possible and specifically permitted; hence, at no time does Entergy Operations anticipate non-compliance.

As a long term solution to the situation which created this emergency condition, the NRC should review and approve the methodology for establishing fuel burnup, as set forth in the July 20, 1989, request and issue an appropriate Safety Evaluation Report (SER) to that effect.

Determination of Significant Hazards

Entergy Operations has performed an analysis of the proposed change in accordance with 10CFR90.91(a)(1) regarding no significant hazard consideration, using the standards in 10CFR90.92(c).

A discussion of those standards as they relate to this amendment request follow:

Criterion 1 - Does not Include a Significant Increase in the Probability or Consequence of an Accident Previously Evaluated.

The effects of extended burnup up to 60 MWD/Kg have been evaluated in the the Combustion Engineering Topical Report CEN-386-P with respect to the previously identified 21 fuel performance topics that were judged to be burnup dependent and/or important in determining the behavior of extended burnup fuel. Using the results of this Topical Report, it was concluded that the fuel performance characteristics do not significantly change with extended burnup up to 60 MWD/Kg and with the exception of the fuel handling accident, no change in consequences of a design basis accident is expected.

With respect to the fuel handling accident, extended burnup will result in fewer fuel movements over the life of the plant in comparison to lower burnup fuel management schemes and thus a decrease in the probability of an accident occurrence. The consequences of a fuel handling accident are also not significantly affected. The effect of extended burnup with respect to offsite dose consequences as a result of a fuel handling accident has been previously evaluated by the NRC in NUREG/CR-5009, "Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors." This report concludes that there would be a slight increase (by 20%) in thyroid doses resulting from increased Iodine 131 gas activity from burnups to 60 MWD/Kg. The resulting doses are small fractions of the applicable regulatory requirements of 10CFR Part 100 as concluded in Calvert Cliffs Safety Evaluation Report of January 10, 1990.

Criterion 2 - Does not Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated

Since the early 1980's, significant data have been accumulated on the effects of high burnup on fuel. This data and analytical techniques have been utilized to project the effects of high burnup in support of this amendment. The measured and projected effects show the fuel will continue to exhibit stable predictable performance. Therefore, no new or different kind of accident will be created.

Criterion 3 - Does not Involve a Significant Reduction in the Margin of Safety

The Topical Report in support of this amendment has evaluated the 21 fuel performance topics that were judged to be burnup dependent and/or important in determining the behavior of extended burnup fuel. This evaluation for each cycle concluded adequate margins of safety continue to be provided with fuel burnup to 60 MWD/Kg.

Additional Significant Hazards Analysis Input

The Commission has provided guidance regarding requests for license amendments that are not likely to involve a significant hazards consideration, see 48 Fed. Reg 14870 (1983). This change appears most likely to fit under Example (ii) as the type of change that does not involve a significant hazard. In particular, Example (ii) refers to changes that provide additional limitations, restrictions, or controls, not presently included in the Technical Specifications.

In this case, the proposed increase in the fuel pin burnup limit actually incorporates a condition in the license that previously was not in the license or Technical Specifications. While Entergy Operations restricted ANO-2 to a limit of 52 MWD/Kg in accordance with prior generic approvals, the limitations were not previously incorporated in the license (including Technical Specifications) subject to the review and approval criteria of 10CFR50.91. Therefore, this change actually imposes a ~~more~~ stringent requirement than had previously existed -- a situation described in Example (ii) is likely not to involve a significant hazards consideration.

6. A procedure identifying the authority responsible for the interpretation of the data, and the sequence and timing of administrative events required to initiate corrective action.

2.C.(4) (Number has never been used.)

- (5) EOI shall implement a program to reduce leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident to as low as practical levels. This program shall include the following:
 1. Provisions establishing preventative maintenance and periodic visual inspection requirements, and
 2. Integrated leak test requirements for each system at a frequency not to exceed refueling cycle intervals.
- (6) EOI shall implement a program which will ensure the capability to accurately determine the airborne iodine concentration in vital areas under accident conditions. This program shall include the following:
 1. Training of personnel,
 2. Procedures for monitoring, and
 3. Provisions for maintenance of sampling and analysis equipment.

2.C.(7) Deleted per Amendment 78, 7/22/86.

(8) Antitrust Conditions

EOI shall not market or broker power or energy from Arkansas Nuclear One, Unit 2. AP&L is responsible and accountable for the actions of its agents to the extent said agent's actions affect the marketing or brokering of power or energy from ANO, Unit 2.

(9) Rod Average Fuel Burnup

Entergy Operations is authorized to operate the facility with an individual rod average fuel burnup (burnup averaged over the length of a fuel rod) not to exceed 60 megawatt-days/kilogram of uranium.

D. Physical Protection

EOI shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10