September 27, 2004

Mr. Gregg R. Overbeck
Senior Vice President, Nuclear
Arizona Public Service Company
P. O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 - ISSUANCE OF AMENDMENTS RE: INTERNAL FUEL PIN PRESSURE (TAC NOS. MC0620, MC0621, AND MC0622)

Dear Mr. Overbeck:

The Commission has issued the enclosed Amendment No. 153 to Facility Operating License No. NPF-41, Amendment No. 153 to Facility Operating License No. NPF-51, and Amendment No. 153 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, respectively. The amendments authorize revisions to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated August 22, 2003.

The implementation of these amendments include incorporating into the UFSAR the description of the approved change to the maximum fuel pin pressurization criteria used in the evaluation of the design basis fuel-handling accident, as described in the amendment application of August 22, 2003.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Mel B. Fields, Senior Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529,
and STN 50-530

Enclosures:
1. Amendment No. 153 to NPF-41
2. Amendment No. 153 to NPF-51
3. Amendment No. 153 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

cc:
Mr. Steve Olea
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, AZ 85007

Douglas Kent Porter
Senior Counsel
Southern California Edison Company
Law Department, Generation Resources
P.O. Box 800
Rosemead, CA 91770

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 40
Buckeye, AZ 85326

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Harris Tower & Pavillion
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Chairman
Maricopa County Board of Supervisors
301 W. Jefferson, 10th Floor
Phoenix, AZ 85003

Mr. Aubrey V. Godwin, Director
Arizona Radiation Regulatory Agency
4814 South 40 Street
Phoenix, AZ 85040

Mr. M. Dwayne Carnes, Director
Regulatory Affairs/Nuclear Assurance
Palo Verde Nuclear Generating Station
P.O. Box 52034
Phoenix, AZ 85072-2034

Mr. Hector R. Puente
Vice President, Power Generation
El Paso Electric Company
310 E. Palm Lane, Suite 310
Phoenix, AZ 85004

Mr. John Taylor
Public Service Company of New Mexico
2401 Aztec NE, MS Z110
Albuquerque, NM 87107-4224

Ms. Cheryl Adams
Southern California Edison Company
5000 Pacific Coast Hwy Bldg DIN
San Clemente, CA 92672

Mr. Robert Henry
Salt River Project
6504 East Thomas Road
Scottsdale, AZ 85251

Mr. Jeffrey T. Weikert
Assistant General Counsel
El Paso Electric Company
Mail Location 167
123 W. Mills
El Paso, TX 79901

Mr. John Schumann
Los Angeles Department of Water & Power
Southern California Public Power Authority
P.O. Box 51111, Room 1255-C
Los Angeles, CA 90051-0100

Brian Almon
Public Utility Commission
William B. Travis Building
P. O. Box 13326
1701 North Congress Avenue
Austin, TX 78701-3326

September 27, 2004

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Dear Mr. Overbeck:

The Commission has issued the enclosed Amendment No. **153** to Facility Operating License No. NPF-41, Amendment No. **153** to Facility Operating License No. NPF-51, and Amendment No. 153 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, respectively. The amendments authorize revisions to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated August 22, 2003.

The implementation of these amendments include incorporating into the UFSAR the description of the approved change to the maximum fuel pin pressurization criteria used in the evaluation of the design basis fuel-handling accident, as described in the amendment application of August 22, 2003.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,
/RA/
Mel B. Fields, Senior Project Manager, Section 2
Project Directorate IV
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***SE Input Memorandum Dated August 27, 2004**

ACCESSION NO: ML042720349 **NRR-058**

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ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated August 22, 2003, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 153, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR), as set forth in the application for amendment by APS dated August 22, 2003. APS shall update the UFSAR to incorporate the description of the approved change to the maximum fuel pin pressurization criteria used in the evaluation of the design basis fuel-handling accident as described in the amendment application of August 22, 2003, and the NRC staff's safety evaluation enclosed to this amendment, and shall submit the revised description authorized by this amendment with the next update of the UFSAR.

3. This license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance. The UFSAR changes shall be implemented in the next periodic update to the UFSAR in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/
Robert A. Gramm, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: September 27, 2004

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated August 22, 2003, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 153, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR), as set forth in the application for amendment by APS dated August 22, 2003. APS shall update the UFSAR to incorporate the description of the approved change to the maximum fuel pin pressurization criteria used in the evaluation of the design basis fuel-handling accident as described in the amendment application of August 22, 2003, and the NRC staff's safety evaluation enclosed to this amendment, and shall submit the revised description authorized by this amendment with the next update of the UFSAR.

3. This license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance. The UFSAR changes shall be implemented in the next periodic update to the UFSAR in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: September 27, 2004

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority dated August 22, 2003, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 153, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR), as set forth in the application for amendment by APS dated August 22, 2003. APS shall update the UFSAR to incorporate the description of the approved change to the maximum fuel pin pressurization criteria used in the evaluation of the design basis fuel-handling accident as described in the amendment application of August 22, 2003, and the NRC staff's safety evaluation enclosed to this amendment, and shall submit the revised description authorized by this amendment with the next update of the UFSAR.

3. This license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance. The UFSAR changes shall be implemented in the next periodic update to the UFSAR in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: September 27, 2004

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 153 TO FACILITY OPERATING LICENSE NO.

NPF-41, AMENDMENT NO. 153 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 153 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By letter dated August 22, 2003, Arizona Public Service Company (APS or the licensee) requested a license amendment for Palo Verde Nuclear Generating Station (Palo Verde) Units 1, 2, and 3. The proposed change will revise three sections of the Palo Verde Updated Final Safety Analysis Report (UFSAR) to amend the maximum fuel pin pressurization criteria used in the evaluation of the design basis fuel-handling accident (FHA).

1.1 UFSAR Section 1.8

Palo Verde UFSAR Section 1.8 discusses the conformance of plant design with the guidelines presented in the Nuclear Regulatory Commission (NRC) regulatory guides. Since the proposal to amend the maximum fuel pin pressurization criteria deviates from the language of Regulatory Position C.1.b of Regulatory Guide (RG) 1.25, “Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors,” APS proposes to add a statement addressing the proposed deviation.

1.2 UFSAR Section 15.7.4.1.3.C

Palo Verde UFSAR Section 15.7.4.1.3.C addresses the evaluation of the design basis FHA for Palo Verde Units 1, 2, and 3. Section 15.7.4.1.3.C contains text that refers to conformance with RG 1.25. Since the proposal to amend the maximum fuel pin pressurization criteria deviates from the language of Regulatory Position C.1.b of RG 1.25, APS proposes to add a statement addressing the proposed deviation.

1.3 UFSAR Table 15.7.4-1, “Parameters used in Evaluating the Radiological Consequences of a Fuel Handling Accident”

Palo Verde UFSAR Table 15.7.4-1 tabulates FHA analysis assumptions. APS proposes to modify the present entry “Max. fuel pin pressure, psig [pounds per square inch gauge]” by appending the phrase, “(average pressure for 236 fuel rods in peak assembly)” and replacing the calculational assumption “1,200 @ 100 hrs. decay(2)” with “Peak assembly average fuel pin pressure is <1200 when fuel is being moved(2).”

The requested change is necessary because future core loadings will include fuel containing erbia poison with ZIRLO cladding. This fuel will develop peak pin pressures that will be in excess of 1200 psig during irradiated fuel movement. The 1200 psig criterion is stated in RG 1.25 as a prerequisite for taking credit for the decontamination of the radioiodine released from the ruptured fuel pins as the volatile gas rises through the spent fuel pool. If the pressure is greater than 1200 psig, the RG states that the decontamination factor will be less and must be calculated on an individual case basis.

The APS proposal would change the basis of the 1200 psig criterion from the peak fuel pin to the average pin pressure in the limiting assembly. The licensee proposed no change in the decontamination factor. The existing analyses of record for the FHA are not affected by the proposed change.

2.0 REGULATORY EVALUATION

This amendment request involves a proposed change to an applicability prerequisite for an assumption used in the Palo Verde design basis FHA analysis. The Palo Verde analysis of record is based upon the guidance of RG 1.25. This guidance established criteria for the use of an analysis assumption regarding spent fuel pool decontamination of the radioiodine released from the damaged fuel pins. Compliance with RGs is not required and methods and assumptions different from those set out in the RG will be acceptable if they provide a basis for the requisite safety findings. The regulatory requirements for which the NRC staff based its acceptance are the accident dose criteria in Title 10 of the *Code of Federal Regulations* (CFR), Section 100.11 and 10 CFR Part 50, Appendix A, General Design Criterion 19.

3.0 TECHNICAL EVALUATION

3.1 Background

Design-basis accidents (DBAs) are analyzed during plant licensing to evaluate the robustness of the structures, systems, and components included in a nuclear power plant design with regard to their ability to mitigate the consequences of the release of radioactive materials to the environment during accident conditions. Conservative assumptions are used in these DBA analyses for the purpose of comparing calculated doses resulting from the postulated release of fission products from the fuel against the guidelines in 10 CFR Part 100. An accident involving the movement of irradiated fuel during periodic refueling operations has been identified as a DBA which could, as a result of a mechanical malfunction, release a fraction of the fission product inventory of the reactor fuel to the environment.

RG 1.25 provides guidance to licensees on acceptable methods and assumptions for performing assessments of the radiological consequences of design basis FHAs. A design basis FHA postulates that an irradiated fuel assembly is dropped resulting in breaching of the fuel pin cladding and the release of a portion of the volatile fission products from the damaged fuel pins. Since all movement of irradiated fuel is performed under water, the accident occurs under water and the released fission gases ascend through the spent fuel pool water overlaying the damaged fuel assembly. A portion of these gases will be absorbed by the overlaying spent fuel pool water. Absorption by the pool water results in a decontamination of the fission product release. RG 1.25 provides regulatory positions regarding the amount of decontamination (i.e., the pool decontamination factor, or DF) acceptable to the NRC staff.

The technical bases for many of the assumptions of RG 1.25 are contained in a 1971 Atomic Energy Commission (AEC) staff paper by G. Burley (Reference 1). This paper was based, in part, on experimental work performed by the Westinghouse Electric Company that was reported in the proposed WCAP-7518L topical report (Reference 2). Westinghouse conducted an experimental test program to evaluate the extent of iodine decontamination of the fission gases released from a damaged irradiated fuel assembly. The test program involved small-scale tests with iodine and carbon dioxide in an inert carrier and large scale tests with carbon dioxide gas released from a modified fuel assembly submerged in a 23-foot pool. Bubble rise time and DF were measured for various combinations of bubble sizes and gas pressures.

The DF is a function of the bubble size and the bubble rise time, both of which are functions of fuel pin pressure. The test results showed that the DF decreased with increasing fuel pin pressure. For reasons that are not readily discernable, the AEC staff declined to approve the WCAP methodology. In Burley, the staff performed a parametric analysis using the WCAP bubble rise data for a pool depth of 23 feet, varying both the bubble diameter and the iodine partition factor. The AEC staff qualitatively selected a central value on the axis between the most and least conservative values such that the effective DF, considering both elemental and organic iodine, would be a factor of 100. This decontamination factor of 100 is provided in Regulatory Position C.1.g of RG 1.25. Since the maximum fuel pin pressure used in the Westinghouse experiments was 1200 psig and since the AEC staff calculations were performed assuming a 23-foot depth pool, these two parameters were stated as prerequisites in Regulatory Positions C.1.b and C.1.c, and expanded upon in Footnote 2 of RG 1.25:

> b. The maximum fuel rod pressurization is[2] is 1200 psig.
>
> c. The minimum water depth[2] between the top of the damaged fuel rods and the fuel pool surface is 23 feet.
>
> [2]For release pressures greater than 1200 psig and water depths less than 23 feet, the iodine decontamination factors will be less than those assumed in this guide and must be calculated on an individual case basis using assumptions comparable in conservatism to those of this guide.

In November 1999, the staff performed an evaluation of whether the assumptions used in the analysis for assessing the radiological consequences of a postulated FHA are conservative for high burnup fuel (Reference 3). The evaluation concluded that adequate conservatism was provided by the analysis assumptions. In particular, the NRC staff concluded that an effective pool DF of only 100 is likely overly conservative. (In RG 1.183, “Alternative Radiological Source

Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," and RG 1.195, "Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors," the NRC staff increased the acceptable DF to 200.)

Fuel pins are manufactured with internal voids to provide space, known as fuel pin plenum or gap, for the collection of fission gases created during power operations. Fission gases migrate from the fuel pellet to the fuel pin gap. As irradiation continues, the increasing amount of accumulated fission gases increases the internal fuel pin pressure. The buildup of fuel pin internal pressure is a function of the relative thermal power of that fuel pin. The thermal power of the individual fuel pins in the core is dependent on the core average power, the enrichment of the fuel pellets, the location of the fuel pin relative to control rods or burnable poisons, the burnup history of the fuel pin, the location of the fuel pin relative to the core periphery, and other considerations. As such, the fuel pins operate at different thermal powers and have different pressurizations. In various aspects of core design and analysis, it is common to conservatively consider the fuel pin with the limiting thermal power, known as the peak rod. The gas pressurization is determined by analysis models (e.g., FRAPCON) that estimate gas production as a function of thermal power. These analyses do not evaluate the gas production in each pin, but rather the production in a peak pin, the assumption being that the pressurization in this pin would bound the pressurization in the remaining pins. The difference between the thermal power of the peak pin and that of the other pins in a given fuel assembly is known as the pin-to-box ratio. Due to constraints imposed by the loss-of-coolant analysis, the minimum pin-to-box is 2 percent; the peak rod power will be at least 2 percent greater than that of other pins in the fuel assembly. The maximum pin-to-box ratio is maintained low by design in the interest of economic fuel utilization. Typically, the maximum pin-to-box ratio is about 10 percent. Thus, the potential magnitude of the variance between peak and minimum pin pressures is constrained. In addition, the maximum fuel pin pressurization at normal operating conditions is constrained by fuel design approvals.

The peak pin approach is generally conservative. However, gases released from some burnable poisons can be a source of additional internal pin pressurization. In particular, gas releases from zirconium diboride pellet coatings (i.e., integrated fuel burnable absorber (IFBA)) are largely independent of thermal power and analyses based on the peak pin thermal power may not be bounding. Since the zirconium diboride is a thin coating on the surface of the fuel pellets, helium released by the boron reaction migrates readily to the fuel pin gap.

3.2 APS Proposal

APS proposes to use the peak assembly average fuel pin pressurization rather than the maximum fuel rod pressurization specified in RG 1.25. APS states that fuel containing erbia poison with ZIRLO cladding manufactured by Westinghouse will develop peak pin pressures that will be in excess of 1200 psig during irradiated fuel movement. As an example, APS states that the calculated peak pin pressure for a future core load involving the fuel with erbia poison and ZIRLO clad would be 1233 psig at the core licensing burnup limit of 60,000 MWD/MTU. APS states that the peak fuel pin pressures for other fuel types (e.g., ZIRLO without erbia, Zircalloy with and without erbia) will remain less than the 1200 psig criterion.

It is not expected that the maximum fuel pin pressurization criterion of 1200 psig will be exceeded until sometime in Unit 2 cycle 13. APS states the core design for Unit 3 cycle 12 has

not been completed and until the design is completed there is a potential that the criterion could be exceeded prior to Unit 2 cycle 13. Currently, only the ZIRLO fuel pins with erbia poison could exceed the 1200 psig criteria. Since the fuel pins with erbia represent only about 1/3 of the fuel pins in an assembly, the peak assembly average pressurization will be less than 1200 psig.

APS notes that by changing the criterion to average fuel pin pressurization in the limiting assembly, the other methods and assumptions used in the design basis FHA remain the same as the current analysis of record. APS states that the methodology for the FHA predicts a non-mechanistic failure of all fuel pins within an assembly and that, as such, it is appropriate to determine the DF based on the peak assembly average. APS noted that the NRC staff had recognized the conservatism in the DF in raising the DF in RG 1.183 to 200, and that the guide did not include a pin pressure criterion. The pressurization criterion was inadvertently omitted from the guide and will be restored in a future revision.

3.3 Staff Evaluation

The non-mechanistic assumption that all of the fuel pins are ruptured in a design basis FHA results in the simultaneous release of a large number of small bubbles. Given the small pitch of the 14 x 14 fuel assembly relative to the inner diameter of the fuel pins, it is reasonable to assume that there would be considerable coalescing of the bubbles released from the severed fuel pins. In coalescing, the internal pressure difference between the fuel pins would tend to average out, providing support for the APS proposal to use peak assembly average pressure. The bubble rise and DF test approach involved a sudden burst of pressurized test gas released from a test apparatus that simulated a 14 x 14 fuel assembly without fuel pellets. The test apparatus was positioned vertically to minimize the depth of the overlaying water and to allow the initial velocity of the released gas to be dissipated vertically, increasing the rate of bubble rise.

If the pressure in an individual pin were to be greater than that of the neighboring pins, it could be possible for the bubbles from the higher pressure pin to rise fast enough to escape coalescing with adjacent bubbles. In this case, the use of the assembly average pin power might result in an over-estimated DF for the high pin because of the shorter bubble rise time. However, this is a highly unlikely situation. There will be a distribution of pressures from the peak pin pressure down to that of the low pin. Thus, it is reasonable to use peak assembly average pressure since the size and rate of rise of the discharged bubbles will mix and average out. The NRC staff considered what the potential impact on the DF would be for the unlikely case of a single high pressure pin. Using the Westinghouse test data and calculation methodology and an arbitrary internal pressure of 1300 psig, the NRC staff calculated a pool DF in excess of 500. This is a factor of five margin over the DF in the Palo Verde current analysis of record of 100. The NRC staff used a bubble diameter of 0.71 cm, which was the value reported for a pressure of 1200 psig. Since the DF is inversely proportional to the bubble size, this is a conservative assumption. However, using a larger effective diameter of 1.2 cm as suggested by Burley for 1200 psig, the DF at a pressure of 1300 psig is about 230, a margin of 2.3. It needs to be noted that the higher energetic discharge at the higher pressure favors the break up the discharge into bubbles with smaller diameters, further enhancing the DF.

The NRC staff finds that the proposed use of the peak assembly average pressure to be an acceptable alternative to Regulatory Position C.1.b of RG 1.25 for fuel that does not incorporate

zirconium diboride IFBA. The NRC staff bases this decision upon its review of the bases for RG 1.25, the available data in references 1, 2, and 3, the increase in internal pressure in zirconium diboride fuel pellet coatings independent of thermal power, and the large margin between the DF in the Palo Verde current analysis of record of 100 and that associated with peak pin pressures up to 1300 psig.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arizona State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding published on December 9, 2003 (68 FR 68656). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Burley, G., "Evaluation of Fission Product Release and Transport for a Fuel Handling Accident," USAEC 1971 (ML8404290400)

2. Bell, M.J., et al, "Topical Report: Radiological Consequences of a Fuel Handling Accident," Westinghouse Electric Corporation WCAP-7518-L (ML9804290400)

3. Black, S.C., letter dated November 24, 1999, "Task Interface Agreement 99-03 - Potential Non-Conservative Assumptions for Fuel Handling Accidents" (ML993340497)

Principal Contributor: Stephen F. LaVie

Date: September 27, 2004