

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of  
PHILADELPHIA ELECTRIC COMPANY

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Docket Nos. 50-277  
50-278

APPLICATION FOR AMENDMENT  
OF  
FACILITY OPERATING LICENSES  
DPR-44  
DPR-56

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Philadelphia Electric Company, Licensee under Facility Operating Licenses DPR-44 and DPR-56, for the Peach Bottom Atomic Power Station (PBAPS) Unit No. 2 and Unit No. 3, respectively, hereby requests that the Technical Specifications contained in Appendix A to the Operating Licenses be amended. Proposed changes to the Technical Specifications are indicated by vertical bars in the margins of the attached page 103 and Bases page 110.

Introduction

Peach Bottom Technical Specifications (Section 3.3.B.4, Limiting Conditions for Operation) currently require a Source Range Monitor (SRM) count rate of greater than or

equal to 3 cps on at least two channels before control rods may be withdrawn for startup. The corresponding Surveillance Requirement, Specification 4.3.B.4, requires that this count rate be verified prior to control rod withdrawal for startup or during refueling. Due to the extended shutdown of both units (Unit 2 shut down March 14, 1987 and Unit 3 shut down March 31, 1987), it appears likely that the present count rate criterion cannot be satisfied when restart of the units is anticipated. Consequently, to permit startup of these units without the use of installed neutron sources, a change to the Technical Specifications is proposed to allow withdrawal of control rods for startup when at least three SRM channels are indicating greater than or equal to 0.7 cps with a signal-to-noise ratio greater than or equal to two (2).

The proposed changes in this Application are grouped into two categories. The Category A change applies to both units and is described above. The Category B change is an administrative change which places back into the Unit 2 Technical Specifications a phrase that was inadvertently deleted in an amendment request dated February 19, 1982 and issued by the NRC as Amendment 86 dated June 17, 1982.

Licensee requests that the proposed changes be effective upon date of amendment issuance.

#### System Discussion - Category A

The SRM system consists of four identical neutron detection channels. Each channel contains a miniature, in-core fission chamber; a pulse preamplifier; an equipment drawer; and remote reading indicators. Each detector is equipped with a motor driven mechanism to allow retraction from the core at neutron flux levels above the SRM range.

The SRM system monitors thermal neutron flux in the core over a range sufficient to observe the core shutdown source level, the approach to criticality and the overlap into the Intermediate Range Monitoring (IRM) system. The indicating range of the SRM may be extended by retracting the detectors from the core. The SRM system provides four channels of neutron flux level information displayed over a range of  $10^{-1}$  to  $10^6$  cps (corresponding to  $10^{-7}\%$  to  $1\%$  of rated thermal power) and four channels of flux level rate of change information displayed as reactor period over a range of -100 to +10 seconds.

The SRM fission chambers are operated in the pulse counting mode and produce discrete output pulses which represent the composite effect of thermal neutron flux and gamma flux (noise) at the detector. Due to the nature of the detector, the pulses produced by thermal neutrons are of much greater magnitude than those produced by gamma, although the number of gamma pulses may far exceed the number of neutron pulses. An electronic circuit performs a discrimination action based on the amplitude of these pulses, thus producing an output signal proportional only to the neutron count rate.

#### Description of Change - Category A

Licensee proposes the following changes to the Units 2 and 3 Technical Specifications:

- (1) Revise Specifications 3.3.B.4 and 4.3.B.4 on p. 103 to designate that the observed count rate, during startup only, may be provided by "at least three source range channels" with an "observed count rate greater than or equal to 0.7 cps and a signal-to-noise ratio greater than or equal to 2."
- (2) Revise the Bases to Specification 3.3.B and 4.3.B to clarify the 0.7 cps required for startup.

## Safety Discussion - Category A

The necessity for maintaining a minimum count on the SRMs at all times is based on the most conservative evaluation which includes fresh fuel loaded in the initial fuel cycle with no neutron sources present. A multiplying medium with no neutrons present forms the basis for the accident scenario in which reactivity is gradually but inadvertently added until the medium is highly supercritical. The introduction of some neutrons at this point would cause the core to undergo a sudden power burst, rather than a gradual startup, with no warning from the nuclear instrumentation. This scenario is of concern when a reactor is loaded with fresh fuel, but is of less concern when loaded with irradiated fuel.

Irradiated fuel continuously produces neutrons by spontaneous fission of certain plutonium isotopes, photo fission, and photo disintegration of deuterium naturally present in the moderator. The neutron production in irradiated fuel is normally great enough to meet the minimum count for a full core after a refueling outage. Due to the extended shutdown of the Peach Bottom units, the minimum count level of 3 cps may not be maintained. The Peach Bottom Technical Specifications bases state that "the requirement of at least 3 counts per second assures that any transient, should it occur, begins at or above the initial value of  $10^{-8}\%$  of rated power used in analyses of transient cold conditions." A review of Chapter 14 of the Peach Bottom FSAR has confirmed the use of  $10^{-8}\%$  of rated power in analyses of transient cold conditions.

Since 0.1 cps, the bottom of the SRM range, corresponds to approximately  $10^{-7}\%$  of rated power, it is concluded that reducing the downscale setpoint to 0.7 cps will not invalidate the assumptions used in the transient analyses. Further, stipulating a signal-to-noise ratio of at least two assures that the SRM's are indeed

responding to neutrons and the neutron flux level is well above  $10^{-8}\%$  of rated power.

A provision which authorizes an SRM downscale setpoint of 0.7 cps provided the signal-to-noise ratio is greater than or equal to two is incorporated in the Technical Specifications for Limerick Generating Station Unit 1 (see Section 3/4.3.7.6 of Appendix A to NPF-39). The Peach Bottom and Limerick SRMs are identical. Further, NRC Regulatory Guide 1.68, Revision 2, August 1978 states that for the initial approach to criticality "a neutron count rate of at least 1/2 count per second should register on the startup channels before the startup begins, and the signal-to-noise ratio should be known to be greater than two."

#### No Significant Hazards Consideration - Category A

Pursuant to 10 CFR 50.92, allowing withdrawal of control rods for startup when at least three SRM channels are indicating greater than or equal to 0.7 cps with a signal-to-noise ratio greater than or equal to two (2) has been reviewed. It has been determined that this change does not involve a significant hazards consideration for the following reasons:

- i) The proposed Category A change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

This change reduces the minimum SRM count rate required to permit withdrawal of control rods to achieve criticality during startup. The revised count rate of 0.7 cps is still within the design range of the SRM and specifying a minimum signal-to-noise ratio of two (2) assures the SRMs are responding to thermal neutron flux. No hardware changes are required

to the SRM system; therefore malfunction of an SRM will still produce the required rod withdrawal blocks.

The only applicable accidents related to the proposed change are those involving SRMs during startup: the rod drop accident (RDA) and the continuous rod withdrawal. The RDA is the more limiting. Other accident scenarios involving SRMs are refueling scenarios which are not related to this change request since it applies to startup only. Chapter 14 (Sections 14.5 and 14.6) of the FSAR assumes  $10^{-8}\%$  of rated power in analysis of transient cold conditions including the design basis RDA. Therefore, reduction of the minimum SRM count rate required to withdraw control rods to 0.7 cps still ensures criticality will be achieved well above  $10^{-8}\%$  of rated power. Further, this proposed change has been previously incorporated into the Limerick Unit 1 Technical Specifications in August 1985 and conforms with the guidance of Regulatory Guide 1.68.

- i) The proposed Category A change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

No hardware modifications are required to implement this change. The design functions of the SRM system are not being changed. The only effect of this change is a reduction in the minimum count rate required for control rod withdrawal which remains bounded by the assumptions utilized in the FSAR.

- ii) The proposed Category A change does not involve a significant reduction in a margin of safety.

The bases for Technical Specification 3.3.B and 4.3.B state in part "the requirement of at least 3 counts per second assures that any transient, should it occur, begins at or above the initial value of  $10^{-8}$  percent of rated power used in analyses of transient cold conditions." In fact, any observable neutron count rate on the SRM is sufficient to ensure the analyses remain valid. Therefore, reduction of the minimum count rate from the nominal 3 cps to 0.7 cps will not reduce this margin of safety because any transient will still begin at or above  $10^{-6}\%$  of rated power. For completeness, the bases have been revised to add the 0.7 cps for startup.

#### Description of Changes - Category B

Licensee proposes the following change to the Unit 2 Technical Specifications:

Correct Specification 4.3.C.1 to state that scram time testing may be accomplished during operational hydrostatic testing or during startup.

This change will once again make the Unit 2 and Unit 3 Specifications 4.3.C.1 identical.

#### Safety Discussion - Category B

Adding the phrase "during operational hydrostatic testing or" to Specification 4.3.C.1 is administrative because this phrase was inadvertently omitted in a Unit 2 reload Application dated February 19, 1982 and not discovered until preparation of the Category A charges described in this Application. The Unit 3 Specifications contain this phrase, and deletion of it was not discussed by Licensee in the February 1982 Application. The error was inadvertent and therefore reinstatement of the phrase to the Unit 2 Specifications is administrative.



The operational hydrostatic test is defined by Licensee as that hydrostatic test preceding the commencement of reactor startup, and this definition describes normal Peach Bottom practice regarding the test. Other hydrostatic tests conducted at other times are not considered the operational hydrostatic test. During the operational hydrostatic test, pressure is held at normal operating reactor pressure.

#### No Significant Hazards Consideration - Category B

A second example (Example i) provided by the Commission of a change involving no significant hazards consideration, as stated in 51 FR 7751 is a "purely administrative change to the Technical Specifications." The change request contained in Category B conforms to this example and does not constitute a significant hazard consideration in that:

- i) The proposed Category B change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The administrative change returns to the Unit 2 Specification the capability to perform scram timing tests during the operational hydrostatic test. This item was previously in the Technical Specifications and was inadvertently removed. This change restores this Unit 2 Specification to its original text and to be identical to that of Unit 3. This change only corrects an earlier error and hence does not increase the probability or consequences of accidents.

- ii) The proposed Category B change does not create the possibility of a new or different kind of accident from any previously evaluated.

This change only corrects an earlier inadvertent deletion and will restore the Unit 2 specifications to their intended text and make the Unit 2 and 3 Specifications 4.3.C.1 identical as was true prior to the deletion.

- iii) The proposed Category B change does not involve a significant reduction in a margin of safety.

This change does not affect any margin of safety. This change merely corrects a previous deletion.

#### Environmental Impact Assessment

This proposed amendment revises the number of source range monitor channels and the required counts per second for startups only and corrects an administrative error in the scram time testing Specification of Unit 2. Licensee has determined that this amendment involves no increase in the amounts and no change in the types of any effluents that may be released offsite, and has also determined that there is no increase in the individual or cumulative occupational exposure. Therefore, there is no environmental consideration involved and consequently an environmental report is not submitted.

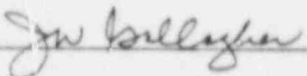
Conclusion

The proposed changes were analyzed to determine the effect upon the accident analyses contained in Section 14 of the PBAPS Updated Final Safety Analysis Report. In addition, a determination of No Significant Hazards Consideration was completed.

The Plant Operations Review Committee and the Nuclear Review Board have reviewed these proposed changes to the Technical Specifications and has concluded that they do not involve significant hazards considerations or an environmental consideration and will not endanger the health and safety of the public.

Respectfully submitted,

PHILADELPHIA ELECTRIC COMPANY



Vice President

COMMONWEALTH OF PENNSYLVANIA :  
 : SS.  
COUNTY OF PHILADELPHIA :

J. W. Gallagher, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company, the Applicant herein; that he has read the foregoing Application for Amendment of Facility Operating Licenses, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

J. W. Gallagher  
Vice President

Subscribed and sworn to  
before me this 31<sup>ST</sup> day  
of Aug., 1988.

Judith Y. Franklin  
Notary Public

JUDITH Y. FRANKLIN  
Notary Public, Phila., Phila. Co.  
My Commission Expires July 23, 1991