February 27, 1985

DMB 01b

Dockets Nos. 50-277
and 50-278

Distribution:
Docket File
NRC & LPDRs
Reading File
Gray Files 4
DEisenhut
RIngram
GGears
OELD
EJordan
PMcKee
JPartlow
CMiles
LHarmon
WJones
TBarnhart 8
DBrinkman
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RDiggs

Mr. Edward G. Bauer, Jr.
Vice President and General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Dear Mr. Bauer:

SUBJECT: TECHNICAL SPECIFICATION AMENDMENTS PERTAINING TO THE MONITORING OF COOLANT LEAKAGE AND THE PROVIDING OF LIMITATIONS ON IODINE CONCENTRATIONS IN THE REACTOR COOLANT

The Commission has issued the enclosed Amendments Nos. 105 and 109 , to Facility Operating Licenses Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Units Nos. 2 and 3. These amendments consist of changes to the Technical Specifications (TSs) in response to your application of May 4, 1983, as supplemented by letter dated November 10, 1983.

The changes to the TSs modify the limiting conditions for operation and surveillance requirements for the sump collection and the flow monitoring system, reduce the Iodine-131 concentration operating limits from 2.0 microcuries/gram to 0.2 microcuries/gram of dose equivalent I-131 and add surveillance testing for Kr-88 in the offgas sample.

In addition, you requested in your November 10, 1983, letter that all limiting conditions for operation, surveillance requirements, calibration frequency requirements and bases for the drywell air monitoring systems be deleted. We are currently reviewing this request. To better understand your request, we wish to meet with your staff in the near future to further discuss your request. We await your response so that arrangements can be made.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the next monthly Federal Register notice.

Sincerely,

"ORIGINAL SIGNED BY:"

Gerald Gears, Project Manager
Operating Reactors Branch No. 4
Division of Licensing

Enclosures:
1. Amendment No. 105 to DPR-44
2. Amendment No. 109 to DPR-56
3. Safety Evaluation

ORB#4:DL	ORB#4:DL	ORB#4:DL	ORAB	AD:OR:DL
RIngram	GGears;cf	JFStolz	LR Finkelstein w/	GCLainas
1/30/85	2/07/85	2/11/85	2/13/85	2/19/85

chgs. made 2/26/85 - ri

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PDR ADOCK 05000277
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Philadelphia Electric Company

cc w/enclosure(s):

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-277

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 105
License No. DPR-44

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

   A. The application for amendment by Philadelphia Electric Company, et al. (the licensee) dated May 4, 1983, as supplemented by a letter dated November 10, 1983, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-44 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 105, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 27, 1985

ATTACHMENT TO LICENSE AMENDMENT NO. 105

FACILITY OPERATING LICENSE NO. DPR-44

DOCKET NO. 50-277

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain a vertical line indicating the area of change.

Remove	Insert
145	145
145a	145a
--	145b
146	146
--	146a
155	155*
156	156
--	156a

*Overleaf page included for document completeness.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.B Coolant Chemistry	4.6.B Coolant Chemistry
1. Coolant Activity Limits Whenever the reactor is critical, the limits on activity concentrations in the reactor coolant shall not exceed the equilibrium value of 0.2 uc/gm of dose equivalent *I-131. This limit may be exceeded for a maximum of 48 hours. During this activity transient the iodine concentration shall not exceed the equilibrium values of 4.0 uc/gram of dose equivalent I-131 whenever the reactor is critical. The reactor shall not be operated under this exception from the equilibrium activity limits for more than 800 hours in any consecutive 12 month period. If the iodine concentration in the coolant exceeds 0.2 uc/gram dose equivalent I-131 for more than 48 continuous hours or is greater than 4.0 uc/gm dose equivalent I-131, the reactor shall be shutdown, and the steam line isolation valves shall be closed within 12 hours.	1. During the equilibrium power operation the sampling frequencies of Table I shall apply. Additional samples shall be taken whenever the reactor coolant concentration exceeds ten percent of the equilibrium value in 3.6.B.1 and one or more of the following conditions are met: a. During startup b. Following a significant power change*** c. Following a significant increase** in the equilibrium offgas level at the steam air ejector over a 1 hour period. Additional samples will also be obtained whenever the equilibrium iodine concentration limit of 3.6.B.1 is exceeded. The additional coolant liquid samples shall be taken at 4 hour intervals for 48 hours, or until two successive samples indicate a decreasing trend below the limiting value of 0.2 uc/gm dose equivalent I-131. However, at least 3 consecutive samples shall be taken in all cases. A gross iodine measurement shall be performed on all samples. If this measurement exceeds 0.2 uc/gm an isotopic analysis to determine dose equivalent I-131 shall be performed.

*That concentration I-131 which alone would produce the same thyroid dose as the quantity and isotopic mixture actually present.

**The following definition will apply to the term significant increase in offgas level.
a) At release rates less than or equal to 75,000 uc/sec significant increase means an increase of 10,000 uc/sec from the previous corresponding power level steady state release rate within 1 hour.
b) At release rates greater than 75,000 uc/sec significant increase means an increase of 15% from the previous corresponding power level steady state release rate within 1 hr.

***For the purpose of this section on sampling frequency a significant power change is defined as a change exceeding 15% of rated power in less than 1 hour.

PBAPS

TABLE I

Location	Measurement	Frequency
Stack gas	Gross activity	Continuous
Off-gas sample at SJAE	Isotopic analysis - including quantitative measurements for at least Xe-133, Xe-135, and Kr-88.	Monthly
Steam Line	Gross activity	Continuous
Coolant liquid sample	a) Isotopic analysis including quantitative measurements for at least I-131, I-132, I-133, and I-135	Monthly (when off-gas release rate at steam air ejector exceeds 75,000 uc/sec)
	b) Quantitative measurements for I-131, I-132, I-133, & I-135	Weekly

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.B Coolant Chemistry	4.6.B Coolant Chemistry
2. The following limits shall be observed for reactor water quality prior to any startup and when operating at rated pressure:	2. A sample of reactor coolant shall be analyzed:
a) Conductivity at 25° C 5.0 umho/cm	a) At least every 4 days at steaming rates above 100,000 pounds per hour for conductivity and chloride ion content.
b) Chloride concentration 0.2 ppm	b) At least every day during startups and at steaming rates below 100,000 pounds per hour for conductivity and chloride ion content.
3. Reactor water quality may exceed the limits of Specification 3.6.B.2 only for the time limits specified below. If these time limits or the maximum quality limits specified are exceeded, the unit shall be placed in Hot Shutdown within 12 hours and in Cold Shutdown within 36 hours, unless a safety analysis, approved by PORC and O&SR Committee, has confirmed that the higher impurity levels will not damage primary system materials.	c) At least every 4 hours during startups and at steaming rates below 100,000 pounds per hour for chloride ion content if the conductivity is above 0.5 umho/cm or if it increases at a rate of 0.2 umho/cm/hr or more.
a) Conductivity at 25° C Time above 5 umho/cm 2 weeks/year Maximum limit 10 umhos/cm	d) At least once every week for total iodine concentration when the air ejector offgas monitor indicates that the stack release rate would be in excess of 100,000 uci/sec assuming a 30 min. holdup.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.B Coolant Chemistry (Cont'd)	4.6.B Coolant Chemistry (Cont'd)
b) Chloride Concentration Time above 0.2 ppm 2 weeks/year Maximum limit 1.0 ppm	
c) pH During operations, if the conductivity exceeds 1.0 umho/cm, pH shall be measured and brought within the 5.6 to 8.6 range within 24 hours. If the pH cannot be corrected, or if the pH is outside a range of 4 to 10, the unit shall be placed in Hot Shutdown within 12 hours and in Cold Shutdown within 36 hours.	
C. Coolant Leakage	C. Coolant Leakage
1. Any time irradiated fuel is in the reactor vessel and reactor coolant temperature is above 212 degrees F, the rate of reactor coolant leakage to the primary containment from unidentified sources shall not exceed 5 gallons per minute. The rate of change of unidentified leakage shall not exceed 2 gallons per minute per 24 hour surveillance period when the reactor is operated in the "Run" mode. In addition, the total reactor coolant system leakage into the primary containment shall not exceed 25 gpm averaged over any 24 hour surveillance period.	1. Reactor coolant system leakage shall be determined by the primary containment (Drywell) sump collection and flow monitoring system and recorded every 4 hours or less. Reactor coolant system leakage shall be checked by the air sampling system and recorded at least once per day.

LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS

3.6.C. Coolant Leakage

2. The primary containment (Drywell) sump collection and flow monitoring system shall be operable during reactor power operation. From and after the time that this system is made or found to be inoperable for any reason, reactor power operation is permissible only during the succeeding 24 hours unless the system is made operable sooner. For purposes of this paragraph, the primary containment (Drywell) sump collection and flow monitoring system operability is defined as the ability to measure reactor coolant leakage.

   The air sampling system shall be operable during reactor power operation. From and after the date that this system is made or found to be inoperable for any reason, reactor power operation is permissible only during the succeeding seven days unless the system is made operable sooner.

3. If the conditions in 1 or 2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown Condition within the following 24 hours.

3.6.B BASES (Cont'd.)

The conductivity of the reactor coolant is continuously monitored. Conductivity instrumentation will be checked every 4 days by instream measurements with an independent conductivity monitor to assure accurate readings. If conductivity is within its normal range, chlorides and other impurities will also be within their normal ranges. A reactor coolant sample will be taken every 4 days for laboratory determination of chlorides. Therefore, the sampling frequency is considered adequate to detect long-term changes in the chloride ion content. Isotopic analyses to determine major contributors to activity can be performed by a gamma scan.

The basis for the equilibrium coolant iodine activity limit is a computed dose to the thyroid of 30 rem at the exclusion distance during the 2-hour period following a steam line break. This dose is computed with the conservative assumption of a release of 140,000 lbs. of coolant prior to closure of the steam line isolation valves and Regulatory Guide 1.5 meteorology.

The maximum activity limit during a short term transient is established from consideration of a maximum iodine less than 300 rem. The probability of a steam line break accident coincident with an iodine concentration transient is significantly lower than that of the accident alone, since operation of the reactor with iodine levels above the equilibrium value is limited to 5 percent of total operation.

The sampling frequencies are established in order to detect the occurrence of an iodine transient which may exceed the equilibrium concentration limit, and to assure that the maximum coolant iodine concentrations are not exceeded. Additional sampling is required following power changes and off-gas transients, since present data indicate that the iodine peaking phenomenon is related to these events.

3.6.C & 4.6.C BASES

Coolant Leakage

Allowable leakage rates of coolant from the reactor coolant system have been based on the predicted and experimentally observed behavior of cracks in pipes and on the ability to makeup coolant system leakage in the event of loss of offsite ac power. The normally expected background leakage due to equipment design and the detection capability for determining coolant system leakage were also considered in establishing the limits. The behavior of cracks in piping systems has been experimentally and analytically investigated as part of the USAEC sponsored Reactor Primary Coolant System Rupture Study (the Pipe Rupture Study). Work utilizing the data obtained in this study indicates that leakage from a crack can be detected before the crack grows to a dangerous or critical size by mechanically or thermally induced cyclic loading, or stress corrosion cracking or some other mechanism characterized by gradual crack growth. This evidence suggests that for leakage somewhat greater than the limit specified for unidentified leakage, the probability is small that imperfections or cracks associated with such leakage would grow rapidly. However, the establishment of allowable unidentified leakage greater than that given in 3.6.C on the basis of the data presently available would be premature because of uncertainties associated with the data. For leakage of the order of 5 gpm, as specified in 3.6.C, the experimental and analytical data suggest a reasonable margin of safety that such leakage magnitude would not result from a crack approaching the critical size for rapid propagation. Leakage less than the magnitude specified can be detected reasonably in a matter of a few hours utilizing the available leakage detection schemes, and if the origin cannot be determined in a reasonably short time, the plant should be shutdown to allow further investigation and corrective action.

A rate of change limit of 2 gpm per 24 hour surveillance period is specified to provide additional conservatism. This limit is applicable to reactor operations in the "Run" mode, during which time there is little variation in primary coolant system pressure. The limit does not apply to the "Startup" mode since this period is characterized by large variations in system pressure and consequently, changes in measured leakage would not be indicative of system degradation. During the limited duration of the startup phase, the 5 gpm limit will ensure the integrity of the primary coolant system.

The total leakage rate consists of all leakage, identified and unidentified, which flows to the drywell floor drain and equipment drain sumps. Both the Drywell floor drain and the equipment drain sumps have pump-out capacitites of 50 gpm per pump. Any one pump can therefore handle in excess of the maximum allowable total leakage of 25 gpm. If the ability to measure pump-out flow from either of these sumps is lost, the inoperable sump will overflow

into the remaining operable sump. The remaining operable sump pump-out flow will then represent the total leakage rate. During the time when one sump is overflowing, any increase in total flow will be assumed to be from an unidentified source. This primary containment (Drywell) sump collection and flow monitoring system can provide viable measurement of reactor coolant system leakage so long as one pump and its associated flow meter are operable.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-278

PEACH BOTTOM ATOMIC POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 109
License No. DPR-56

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

   A. The application for amendment by Philadelphia Electric Company, et al. (the licensee) dated May 4, 1983, as supplemented by a letter dated November 10, 1983, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and 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, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-56 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 109, are hereby incorporated in the license. PECO shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 27, 1985

ATTACHMENT TO LICENSE AMENDMENT NO.109

FACILITY OPERATING LICENSE NO. DPR-56

DOCKET NO. 50-278

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain a vertical line indicating the area of change.

Remove	Insert
145	145
145a	145a
--	145b
146	146
--	146a
155	155*
156	156
--	156a

*Overleaf page included for document completeness.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.B Coolant Chemistry	4.6.B Coolant Chemistry
1. Coolant Activity Limits	1. During the equilibrium power operation the sampling frequencies of Table I shall apply. Additional samples shall be taken whenever the reactor coolant concentration exceeds ten percent of the equilibrium value in 3.6.B.1 and one or more of the following conditions are met: a. During startup b. Following a significant power change*** c. Following a significant increase** in the equilibrium offgas level at the steam air ejector over a 1 hour period.
Whenever the reactor is critical, the limits on activity concentrations in the reactor coolant shall not exceed the equilibrium value of 0.2 uc/gm of dose equivalent *I-131.	Additional samples will also be obtained whenever the equilibrium iodine concentration limit of 3.6.B.1 is exceeded.
This limit may be exceeded for a maximum of 48 hours. During this activity transient the iodine concentration shall not exceed the equilibrium values of 4.0 uc/gram of dose equivalent I-131 whenever the reactor is critical. The reactor shall not be operated under this exception from the equilibrium activity limits for more than 800 hours in any consecutive 12 month period. If the iodine concentration in the coolant exceeds 0.2 uc/gram dose equivalent I-131 for more than 48 continuous hours or is greater than 4.0 uc/gm dose equivalent I-131, the reactor shall be shutdown, and the steam line isolation valves shall be closed within 12 hours.	The additional coolant liquid samples shall be taken at 4 hour intervals for 48 hours, or until two successive samples indicate a decreasing trend below the limiting value of 0.2 uc/gm dose equivalent I-131. However, at least 3 consecutive samples shall be taken in all cases. A gross iodine measurement shall be performed on all samples. If this measurement exceeds 0.2 uc/gm an isotopic analysis to determine dose equivalent I-131 shall be performed.
*That concentration I-131 which alone would produce the same thyroid dose as the quantity and isotopic mixture actually present. **The following definition will apply to the term significant increase in offgas level. a) At release rates less than or equal to 75,000 uc/sec significant increase means an increase of 10,000 uc/sec from the previous corresponding power level steady state release rate within 1 hour. b) At release rates greater than 75,000 uc/sec significant increase means an increase of 15% from the previous corresponding power level steady state release rate within 1 hr.	***For the purpose of this section on sampling frequency a significant power change is defined as a change exceeding 15% of rated power in less than 1 hour.

PBAPS

TABLE I

Location	Measurement	Frequency
Stack gas	Gross activity	Continuous
Off-gas sample at SJAE	Isotopic analysis - including quantitative measurements for at least Xe-133, Xe-135, and Kr-88.	Monthly
Steam Line	Gross activity	Continuous
Coolant liquid sample	a) Isotopic analysis including quantitative measurements for at least I-131, I-132, I-133, and I-135	Monthly (when off-gas release rate at steam air ejector exceeds 75,000 uc/sec)
	b) Quantitative measurements for I-131, I-132, I-133, & I-135	Weekly

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.B Coolant Chemistry	4.6.B Coolant Chemistry
2. The following limits shall be observed for reactor water quality prior to any startup and when operating at rated pressure:	2. A sample of reactor coolant shall be analyzed:
a) Conductivity 5.0 umho/cm at 25° C	a) At least every 4 days at steaming rates above 100,000 pounds per hour for conductivity and chloride ion content.
b) Chloride concentration 0.2 ppm	b) At least every day during startups and at steaming rates below 100,000 pounds per hour for conductivity and chloride ion content.
3. Reactor water quality may exceed the limits of Specification 3.6.B.2 only for the time limits specified below. If these time limits or the maximum quality limits specified are exceeded, the unit shall be placed in Hot Shutdown within 12 hours and in Cold Shutdown within 36 hours, unless a safety analysis, approved by PORC and O&SR Committee, has confirmed that the higher impurity levels will not damage primary system materials.	c) At least every 4 hours during startups and at steaming rates below 100,000 pounds per hour for chloride ion content if the conductivity is above 0.5 umho/cm or if it increases at a rate of 0.2 umho/cm/hr or more.
a) Conductivity at 25° C Time above 5 umho/cm 2 weeks/year Maximum limit 10 umhos/cm	d) At least once every week for total iodine concentration when the air ejector offgas monitor indicates that the stack release rate would be in excess of 100,000 uci/sec assuming a 30 min. holdup.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.B Coolant Chemistry (Cont'd)	4.6.B Coolant Chemistry (Cont'd)
b) Chloride Concentration Time above 0.2 ppm 2 weeks/year Maximum limit 1.0 ppm	
c) pH During operations, if the conductivity exceeds 1.0 umho/cm, pH shall be measured and brought within the 5.6 to 8.6 range within 24 hours. If the pH cannot be corrected, or if the pH is outside a range of 4 to 10, the unit shall be placed in Hot Shutdown within 12 hours and in Cold Shutdown within 36 hours.	
C. Coolant Leakage	C. Coolant Leakage
1. Any time irradiated fuel is in the reactor vessel and reactor coolant temperature is above 212 degrees F, the rate of reactor coolant leakage to the primary containment from unidentified sources shall not exceed 5 gallons per minute. The rate of change of unidentified leakage shall not exceed 2 gallons per minute per 24 hour surveillance period when the reactor is operated in the "Run" mode. In addition, the total reactor coolant system leakage into the primary containment shall not exceed 25 gpm averaged over any 24 hour surveillance period.	1. Reactor coolant system leakage shall be determined by the primary containment (Drywell) sump collection and flow monitoring system and recorded every 4 hours or less. Reactor coolant system leakage shall be checked by the air sampling system and recorded at least once per day.

LIMITING CONDITIONS FOR OPERATION | SURVEILLANCE REQUIREMENTS

3.6.C. Coolant Leakage

2. The primary containment (Drywell) sump collection and flow monitoring system shall be operable during reactor power operation. From and after the time that this system is made or found to be inoperable for any reason, reactor power operation is permissible only during the succeeding 24 hours unless the system is made operable sooner. For purposes of this paragraph, the primary containment (Drywell) sump collection and flow monitoring system operability is defined as the ability to measure reactor coolant leakage.

   The air sampling system shall be operable during reactor power operation. From and after the date that this system is made or found to be inoperable for any reason, reactor power operation is permissible only during the succeeding seven days unless the system is made operable sooner.

3. If the conditions in 1 or 2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown Condition within the following 24 hours.

3.6.B BASES (Cont'd.)

The conductivity of the reactor coolant is continuously monitored. Conductivity instrumentation will be checked every 4 days by instream measurements with an independent conductivity monitor to assure accurate readings. If conductivity is within its normal range, chlorides and other impurities will also be within their normal ranges. A reactor coolant sample will be taken every 4 days for laboratory determination of chlorides. Therefore, the sampling frequency is considered adequate to detect long-term changes in the chloride ion content. Isotopic analyses to determine major contributors to activity can be performed by a gamma scan.

The basis for the equilibrium coolant iodine activity limit is a computed dose to the thyroid of 30 rem at the exclusion distance during the 2-hour period following a steam line break. This dose is computed with the conservative assumption of a release of 140,000 lbs. of coolant prior to closure of the steam line isolation valves and Regulatory Guide 1.5 meteorology.

The maximum activity limit during a short term transient is established from consideration of a maximum iodine less than 300 rem. The probability of a steam line break accident coincident with an iodine concentration transient is significantly lower than that of the accident alone, since operation of the reactor with iodine levels above the equilibrium value is limited to 5 percent of total operation.

The sampling frequencies are established in order to detect the occurrence of an iodine transient which may exceed the equilibrium concentration limit, and to assure that the maximum coolant iodine concentrations are not exceeded. Additional sampling is required following power changes and off-gas transients, since present data indicate that the iodine peaking phenomenon is related to these events.

3.6.C & 4.6.C BASES

Coolant Leakage

Allowable leakage rates of coolant from the reactor coolant system have been based on the predicted and experimentally observed behavior of cracks in pipes and on the ability to makeup coolant system leakage in the event of loss of offsite ac power. The normally expected background leakage due to equipment design and the detection capability for determining coolant system leakage were also considered in establishing the limits. The behavior of cracks in piping systems has been experimentally and analytically investigated as part of the USAEC sponsored Reactor Primary Coolant System Rupture Study (the Pipe Rupture Study). Work utilizing the data obtained in this study indicates that leakage from a crack can be detected before the crack grows to a dangerous or critical size by mechanically or thermally induced cyclic loading, or stress corrosion cracking or some other mechanism characterized by gradual crack growth. This evidence suggests that for leakage somewhat greater than the limit specified for unidentified leakage, the probability is small that imperfections or cracks associated with such leakage would grow rapidly. However, the establishment of allowable unidentified leakage greater than that given in 3.6.C on the basis of the data presently available would be premature because of uncertainties associated with the data. For leakage of the order of 5 gpm, as specified in 3.6.C, the experimental and analytical data suggest a reasonable margin of safety that such leakage magnitude would not result from a crack approaching the critical size for rapid propagation. Leakage less than the magnitude specified can be detected reasonably in a matter of a few hours utilizing the available leakage detection schemes, and if the origin cannot be determined in a reasonably short time, the plant should be shutdown to allow further investigation and corrective action.

A rate of change limit of 2 gpm per 24 hour surveillance period is specified to provide additional conservatism. This limit is applicable to reactor operations in the "Run" mode, during which time there is little variation in primary coolant system pressure. The limit does not apply to the "Startup" mode since this period is characterized by large variations in system pressure and consequently, changes in measured leakage would not be indicative of system degradation. During the limited duration of the startup phase, the 5 gpm limit will ensure the integrity of the primary coolant system.

The total leakage rate consists of all leakage, identified and unidentified, which flows to the drywell floor drain and equipment drain sumps. Both the Drywell floor drain and the equipment drain sumps have pump-out capacitites of 50 gpm per pump. Any one pump can therefore handle in excess of the maximum allowable total leakage of 25 gpm. If the ability to measure pump-out flow from either of these sumps is lost, the inoperable sump will overflow

into the remaining operable sump. The remaining operable sump pump-out flow will then represent the total leakage rate. During the time when one sump is overflowing, any increase in total flow will be assumed to be from an unidentified source. This primary containment (Drywell) sump collection and flow monitoring system can provide viable measurement of reactor coolant system leakage so long as one pump and its associated flow meter are operable.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING

AMENDMENTS NOS. 105 AND 109 TO FACILITY OPERATING LICENSES NOS. DPR-44 AND DPR-56

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNITS NOS. 2 AND 3

DOCKETS NOS. 50-277 AND 50-278

Introduction

By a letter dated May 4, 1983, as supplemented by a letter dated November 10, 1983, Philadelphia Electric Company (the licensee) requested an amendment to Appendix A of Facility Operating Licenses Nos. DPR-44 and DPR-56 for the Peach Bottom Atomic Power Station, Units 2 and 3, respectively. The amendments involve changes to the Technical Specifications relating to the Containment Leak Detection System.

As a result of unacceptable ultrasonic indications in Unit 2 recirculation system piping, the licensee took the corrective actions and committed to implement additional requirements as documented in letters dated August 24, 1983 and November 18, 1983. Based on the licensee's commitments and corrective actions, the Commission issued a Confirmatory Order on November 30, 1983, which included enhanced leak detection requirements.

The licensee's full submittal dated May 4, 1983, contains multiple changes to their Technical Specifications. The scope of this review is limited to those changes associated with the Drywell Sump Collection and Flow Monitoring System, including modifications to limiting conditions for operation, surveillance requirements, changes to the Technical Specification bases (November 10, 1983, supplement) and changes to Iodine-131 limits for the reactor coolant as well as the addition of Kr-88 surveillance testing in the offgas sample. The following specification revisions were reviewed by the NRC staff.

1. Revision of Technical Specification 3.6.C.1 to add a limitation on the rate of change of unidentified leakage to 2 gallons per minute (gpm) per 24 hour surveillance period when the reactor is operating in the "Run" mode.

2. Revision of Technical Specification 3.6.C.2 to restrict power operation to 24 hours from and after the time that the Drywell Sump Collection and Flow Monitoring System is made or found to be inoperable.

3. Revision of Technical Specification 3.6.C.3 to place the reactor in Hot Shutdown within 12 hours when the leakage requirements are not met or when the leakage detection system has been inoperable for a period not exceeding 24 hours.

4. Revision of Technical Specification 4.6.C.1. to increase the frequency of leakge determination to every 4 hours or less.

5. Revision of the affected Technical Specification Bases.

6. Revision of Technical Specification 3.6.B.1 to reduce the operating limit to 0.2 microcuries/gram of dose equivalent I-131 and permitting the limit to be exceeded for a 48-hour period provided it does not exceed 4.0 microcuries/gram.

7. Revision of Table 1 to Technical Specification 4.6.B.1 to include a monthly quantitative analysis for Kr-88 in the offgas sample.

EVALUATION

The proposed changes (1 through 7) were evaluated for their consistency with respect to the applicable requirements and recommendations specified in Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping (NUREG-0313), the Standard Technical Specifications for BWR plants (NUREG-0123, Rev. 3), the Standard Review Plans (NUREG-0800), and the Commission's Confirmatory Order issued on November 30, 1983.

1. The proposed change to Technical Specification (TS) item 3.6.C.1 adds a requirement to limit the rate of change of unidentified leakage to 2 gpm for any 24-hour surveillance period. The surveillance frequency is also changed in a more conservative direction from a daily requirement to once every 4 hours in TS 4.6.C.1.

   These proposed changes are in accordance with the guidance provided in Section IV.B.1.a.2 of NUREG-0313. Furthermore, in accordance with Regulatory Guide 1.45, the flow rate changes of from 0.5 gpm to 1.0 gpm can be reasonably detected in the containment sump by the sump detection system. Therefore, the proposed limit of 2 gpm for flow rate changes is well within the sump flow detection capability. This more restrictive requirement is applicable to the reactor operation in the "Run" mode only. The basis of the limited application to the "Run" mode only is that under this mode of operation, measured changes will represent leakage rate changes from the reactor coolant system. Under "Run" conditions the reactor temperature and pressure are stable; consequently the leakage changes will be valid indications of system degradation. During the "Startup" mode of operation, the system pressure and temperature are changing, resulting in wide variations of the leakage rates. Thus, an increased rate of water collection in the containment sump may not represent system degradation of the reactor pressure boundary during "Startup". Under this mode of operation, the 5 gpm limit on unidentified leakage and the increased surveillance frequency, every 4 hours or less, will ensure the integrity of the reactor coolant system.

2. The proposed change to TS item 3.6.C.2 imposes a limit on continuous power operation to 24 hours from the time of an inoperable sump collection and flow monitoring system.

   The proposed change to limit the continuous operations to 24 hours after the sump collection and flow monitoring system is found to be inoperable is more restrictive than the current TS requirement of seven days.

3. The proposed change to TS 3.6.C.3 requires the reactor to be in hot shutdown condition within 12 hours and in cold shutdown within the following 24 hours if the leakage limits specified in TS 3.6.C.1 or the operability requirements of TS 3.6.C.2 are not met. This is the same requirement as that specified by the Standard Technical Specifications (NUREG-0123, Rev. 3).

4&5. The increased surveillance frequency will provide reactor operators a more accurate status of the reactor coolant system leakage. The rate of leakage change can be projected more accurately to take prompt corrective actions, prior to any significant deterioration of the pressure boundary. The revisions to the Technical Bases (3.6.C and 4.6.C Bases) provide clarification of the intent of coolant leakage detection systems and removes an obsolete reference to a completed action.

6. The proposed change to TS 3.6.B.1 imposes a stricter operating limit on Iodine-131 (0.2 microcuries per gram) for the specific activity in the primary coolant in accordance with the Standard Technical Specifications (NUREG-0123, Rev. 3). The change would also permit a change in additional sampling requirements based upon the 0.2 microcuries per gram change and would permit operation to continue for limited time periods (a period of 48 hours or less) with the primary coolant's specific activity greater than 0.2 microcuries per gram dose equivalent I-131, but less than or equal to 4.0 microcuries per gram. This accommodates possible iodine spiking phenomenon which may occur following changes in thermal power. Operation with specific activity levels exceeding 0.2 microcuries per gram are restricted to no more than 800 hours per year which is also in accordance with the Standard Technical Specifications.

7. The proposed change to Table 1 of Technical Specification 4.6.B.1 adds Kr-88 to the primary coolant specific activity sample and analyses program in accordance with the guidance provided in the Standard Technical Specifications (NUREG-0123, Rev. 3, Table 4.4.6-1).

Based on these considerations, we conclude that the proposed changes enhance the overall margin of safety, and are consistent with the intent of regulatory guidance and the Confirmatory Order issued by the Commission.

Environmental Consideration

These amendments involve changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. We have 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these 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 these amendments.

Conclusion

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: February 27, 1985

The following NRC personnel have contributed to this Safety Evaluation:
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