ATTACHMENT 2

PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 AND 3

Docket Nos. 50-277
50-278

License Nos. DPR-44
DPR-56

TECHNICAL SPECIFICATIONS CHANGE REQUEST
94-06

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LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.B Control Rods (Cont'd.)	4.3.B Control Rods (Cont'd.)
4. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per second.*	4. Prior to control rod withdrawal for startup or during refueling, verify that at least two source range channels have an observed count rate of at least three counts per second.*
5. During operation with limiting control rod patterns, as determined by the designated qualified personnel, either: a. Both RBM channels shall be operable, or b. Control rod withdrawal shall be blocked, or c. The operating power level shall be limited so that the MCPR will remain above the fuel cladding integrity safety limit assuming a single error that results in complete withdrawal of a single operable control rod.	5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s). * May be reduced provided at least three source range channels for startup or at least two source range channels for refueling have an observed count rate and a signal-to-noise ratio on or above the curve shown on Figure 3.3.1.
C. Scram Insertion Times	C. Scram Insertion Times
1. The average scram insertion time, based on the deenergization of the scram pilot valve solenoids as time zero, of all operable control rods in the reactor power operation condition shall be no greater than: % Inserted from Fully Withdrawn / Avg. Scram Insertion Times (sec) 5 / 0.375 20 / 0.90 50 / 2.0 90 / 3.5	1. After each refueling outage or after a reactor shutdown that is greater than 120 days, each control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power. Scram time testing is not required for control rods inserted per Specification 3.3.B.1.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.C (Cont'd)	4.3.C (Cont'd)

2. The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two-by-two array shall be no greater than:

% Inserted From Fully Withdrawn	Avg. Scram Insertion Times (Sec)
5	0.398
20	0.954
50	2.120
90	3.8

2. After any fuel movement within the reactor pressure vessel, only those control rods associated with the core cells affected by the fuel movements shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power.

3. The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.

3. At least once per 120 days of power operation, perform scram time testing for a representative sample of control rods with the reactor steam dome pressure greater than or equal to 800 psig.

4. Prior to declaring affected individual control rods operable after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested at any reactor steam dome pressure. Scram times as a function of reactor steam dome pressures less than 800 psig are provided in the Core Operating Limits Report.

5. Prior to exceeding 40% of Rated Power after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig.

3.3 and 4.3 BASES (Cont'd)

C. Scram Insertion Times

The control rod system is designed to bring the reactor subcritical at a rate fast enough to prevent fuel damage; i.e., to prevent the MCPR from becoming less than the fuel cladding integrity safety limit. Analysis of the limiting power transients shows that the negative reactivity rates resulting from the scram with the average response of all drives as given in the above Specification, provide the required protection.

The numerical values assigned to the specified scram performance are based on the analysis of data from other BWR's with control rod drives the same as those on Peach Bottom.

The occurrence of scram times within the limits, but significantly longer than the average, should be viewed as an indication of a systematic problem with control rod drives especially if the number of drives exhibiting such scram times exceeds one control rod of a (5x5) twenty-five control rod array.

In the analytical treatment of the transients, which are assumed to scram on high neutron flux, 340 milliseconds are allowed between a neutron sensor reaching the scram point and the start of negative reactivity insertion. The 340 milliseconds used in the analyses consist of 140 milliseconds for sensor and circuit delay and 200 milliseconds to start of control rod motion. The 200 milliseconds are included in the allowable scram insertion times specified in Specification 3.3.C. In addition the control rod drop accident has been analyzed in NEDO-10527 and its supplements 1 & 2 for the scram times given in Specification 3.3.C.

Measurement of the scram times with reactor steam dome pressure greater than or equal to 800 psig demonstrates acceptable scram times for the transients analyzed in UFSAR, Appendix K, Section VI and UFSAR Chapter 14.

Maximum scram insertion times occur at a reactor steam dome pressure of approximately 800 psig because of the competing effects of reactor steam dome pressure and stored accumulator energy. Therefore, demonstration of adequate scram times at reactor steam dome pressure greater than 800 psig ensures that the measured scram times will be within the specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time after fuel movement within the reactor pressure vessel or after a shutdown greater than or equal to 120 days or longer, all control rods are required to be tested before exceeding 40% of Rated Power following the shutdown. In the event fuel movement is limited to selected core cells, only those control rods associated with the core cells affected by the fuel movements are required to be scram time tested. However, if the reactor remains shutdown for greater than or equal to 120 days, all control rods are required to be scram time tested.

3.3 and 4.3 BASES (Cont'd)

Additional testing once per 120 days of a sample of the control rods is required to verify the continued performance of the scram function during the cycle. A representative sample contains at least 10% of the control rods. For planned testing, the control rods selected for the sample should be different for each test. Data from inadvertent scrams should be used whenever possible to avoid unnecessary testing at power, even if the control rods with data may have been previously tested in a sample. The 120 day frequency is based on operating experience that has shown control rod scram times do not significantly change over an operating cycle.

When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod operable. The required scram time testing must demonstrate the affected control rod is still within the acceptable limits for reactor pressures less than 800 psig found in the Core Operating Limits Report.

Specific examples of work that could affect the scram times are (but are not limited to) the following: removal of any control rod drive for maintenance or modification; replacement of a control rod; and maintenance or modification of a scram solenoid pilot valve, scram valve, accumulator, isolation valve or check valve in the piping required for scram.

When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate each affected control rod is still within the limits with the reactor steam dome pressure greater than or equal to 800 psig. Where work has been performed at high reactor pressure, the requirements of 4.3.C.4 and 4.3.C.5 can be satisfied with one test. For a control rod affected by work performed while shut down; however, a zero pressure and high pressure test may be required. This testing ensures that, prior to withdrawing the control rod for continued operation, the control rod scram performance is acceptable for operating reactor pressure conditions. Alternatively, a control rod scram test during hydrostatic pressure testing could also satisfy both criteria.

Operability of the scram discharge volume vent and drain valves is necessary for maintaining a reservoir to contain the water exhausted from all control rod drives during a scram.

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LIMITING CONDITIONS FOR OPERATION

3.5.J Local LHGR (Cont'd)

If at any time during operation it is determined by normal surveillance that limiting value for LHGR is being exceeded, action shall be initiated within one (1) hour to restore LHGR to within prescribed limits. If the LHGR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless LHGR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

SURVEILLANCE REQUIREMENTS

3.5.K Minimum Critical Power Ratio (MCPR)

1. During power operation the MCPR for the applicable incremental cycle core average exposure and for each type of fuel shall be equal to or greater than the value given in Specification 3.5.K.2 or 3.5.K.3 times Kf, where Kf is as specified in the CORE OPERATING LIMITS REPORT. If at any time during operation it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall be initiated within one (1) hour to restore MCPR to within prescribed limits. If the MCPR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless MCPR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

4.5.K Minimum Critical Power Ratio (MCPR)

1. MCPR shall be checked daily during reactor power operation at ≥25% rated thermal power.

2. Except as provided in Specification 3.5.K.3, the verification of the applicability of 3.5.K.2.a Operating Limit MCPR Values shall be performed every 120 operating days by scram time testing a representative sample of control rods and performing the following:

a. The average scram time to the 20% insertion position shall be:

$$\tau \text{ ave} \leq \tau \, 8$$

b. The average scram time to the 20% insertion position is determined as follows:

$$\tau \text{ ave} = \frac{\sum_{i=1}^{n} Ni \, \tau \, i}{\sum_{i=1}^{n} Ni}$$

where: n = number of surveillance tests performed to date in the cycle.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.B Control Rods (Cont'd.)	4.3.B Control Rods (Cont'd.)
4. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per second.*	4. Prior to control rod withdrawal for startup or during refueling, verify that at least two source range channels have an observed count rate of at least three counts per second.*
5. During operation with limiting control rod patterns, as determined by the designated qualified personnel, either: a. Both RBM channels shall be operable, or b. Control rod withdrawal shall be blocked, or c. The operating power level shall be limited so that the MCPR will remain above the fuel cladding integrity safety limit assuming a single error that results in complete withdrawal of a single operable control rod.	5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s). * May be reduced provided at least three source range channels for startup or at least two source range channels for refueling have an observed count rate and a signal-to-noise ratio on or above the curve shown on Figure 3.3.1.
C. Scram Insertion Times	C. Scram Insertion Times
1. The average scram insertion time, based on the deenergization of the scram pilot valve solenoids as time zero, of all operable control rods in the reactor power operation condition shall be no greater than: % Inserted from Fully Withdrawn — Avg. Scram Insertion Times (sec) 5 — 0.375 20 — 0.90 50 — 2.0 90 — 3.5	1. After each refueling outage or after a reactor shutdown that is greater than 120 days, each control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power. Scram time testing is not required for control rods inserted per Specification 3.3.B.1.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.3.C (Cont'd)	4.3.C (Cont'd)
2. The average of the scram insertion times for the three fastest control rods of all groups of four control rods in a two-by-two array shall be no greater than: % Inserted From Fully Withdrawn / Avg. Scram Insertion Times (Sec) 5 / 0.398 20 / 0.954 50 / 2.120 90 / 3.8	2. After any fuel movement within the reactor pressure vessel, only those control rods associated with the core cells affected by the fuel movements shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig prior to exceeding 40% of Rated Power.
3. The maximum scram insertion time for 90% insertion of any operable control rod shall not exceed 7.00 seconds.	3. At least once per 120 days of power operation, perform scram time testing for a representative sample of control rods with the reactor steam dome pressure greater than or equal to 800 psig.
	4. Prior to declaring affected individual control rods operable after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested at any reactor steam dome pressure. Scram times as a function of reactor steam dome pressures less than 800 psig are provided in the Core Operating Limits Report.
	5. Prior to exceeding 40% of Rated Power after work on the control rod or control rod drive system that could affect scram insertion time, each affected control rod shall be scram time tested with the reactor steam dome pressure greater than or equal to 800 psig.

3.3 and 4.3 BASES (Cont'd)

C. Scram Insertion Times

The control rod system is designed to bring the reactor subcritical at a rate fast enough to prevent fuel damage; i.e., to prevent the MCPR from becoming less than the fuel cladding integrity safety limit. Analysis of the limiting power transients shows that the negative reactivity rates resulting from the scram with the average response to all drives as given in the above Specification, provide the required protection.

The numerical values assigned to the specified scram performance are based on the analysis of data from other BWR's with control rod drives the same as those on Peach Bottom.

The occurrence of scram times within the limits, but significantly longer than the average, should be viewed as an indication of a systematic problem with control rod drives especially if the number of drives exhibiting such scram times exceeds one control rod of a (5x5) twenty-five control array.

In the analytical treatment of the transients, which are assumed to scram on high neutron flux, 290 milliseconds are allowed between a neutron sensor reaching the scram point and the start of negative reactivity insertion. This is adequate and conservative when compared to the typical time delay of about-210 milliseconds estimated from scram test results. The 290 milliseconds used in the analyses consists of 90 milliseconds for sensor and circuit delay and 200 milliseconds to start of control rod motion. In addition the control rod drop accident has been analyzed in NEDO-10527 and its supplements 1 & 2 for the scram times given in Specification 3.3.C.

Measurement of the scram times with reactor steam dome pressure greater than or equal to 800 psig demonstrates acceptable scram times for the transients analyzed in UFSAR, Appendix K, Section VI and UFSAR Chapter 14.

Maximum scram insertion times occur at a reactor steam dome pressure of approximately 800 psig because of the competing effects of reactor steam dome pressure and stored accumulator energy. Therefore, demonstration of adequate scram times at reactor steam dome pressure greater than 800 psig ensures that the measured scram times will be within the specified limits at higher pressures. Limits are specified as a function of reactor pressure to account for the sensitivity of the scram insertion times with pressure and to allow a range of pressures over which scram time testing can be performed. To ensure that scram time testing is performed within a reasonable time after fuel movement within the reactor pressure vessel or after a shutdown greater than or equal to 120 days or longer, all control rods are required to be tested before exceeding 40% of Rated Power following the shutdown. In the event fuel movement is limited to selected core cells, only those control rods associated with the core cells affected by the fuel movements are required to be scram time tested. However, if the reactor remains shutdown for greater than or equal to 120 days, all control rods are required to be scram time tested.

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When work that could affect the scram insertion time is performed on a control rod or the control rod drive system, testing must be done to demonstrate that each affected control rod retains adequate scram performance over the range of applicable reactor pressures from zero to the maximum permissible pressure. The scram testing must be performed once before declaring the control rod operable. The required scram time testing must demonstrate the affected control rod is still within the acceptable limits for reactor pressures less than 800 psig found in the Core Operating Limits Report.

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3.5.K Minimum Critical Power Ratio (MCPR)

1. During power operation the MCPR for the applicable incremental cycle core average exposure and for each type of fuel shall be equal to or greater than the value given in Specification 3.5.K.2 or 3.5.K.3, or MCPR(F), or the MCPR operating limit as determined by application of MCPR(P), whichever is greater. MCPR(F) and MCPR(P) are provided in the CORE OPERATING LIMITS REPORT. If at any time during operation it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall be initiated within one (1) hour to restore MCPR to within prescribed limits. If the MCPR is not returned to within prescribed limits within five (5) hours, reactor power shall be decreased at a rate which would bring the reactor to the cold shutdown condition within 36 hours unless MCPR is returned to within limits during this period. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

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