

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation with Inoperable Equipment

Whenever the reactor is in Startup mode or Run mode and not in a cold condition, the availability of electric power shall be as specified in 3.9.A except as specified herein.

1. From and after the date that only one offsite power source is available, reactor operation is permissible for 7 days.
2. From and after the date that the 4-kV bus tie board becomes INOPERABLE, reactor operation is permissible indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

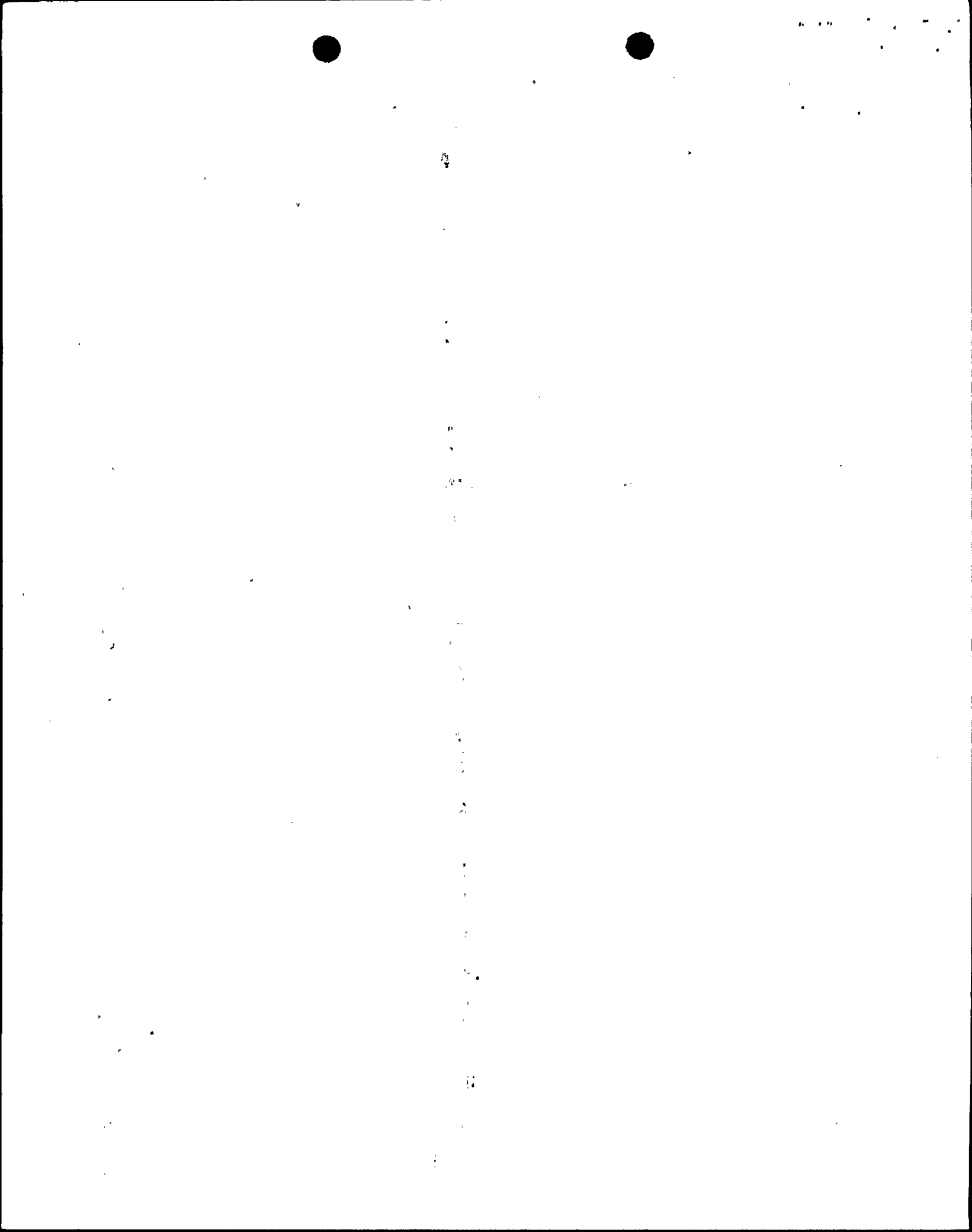
4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all units 1 and 2 diesel generators and ~~associated boards~~ must be demonstrated to be OPERABLE ~~immediately~~ and daily thereafter.

2. When a required offsite power source is unavailable to unit 1 because the 4-kV bus tie board or a start bus is INOPERABLE, all unit 1 and 2 diesel generators and ~~associated boards~~ shall be demonstrated OPERABLE ~~immediately and daily~~ thereafter. The remaining offsite source and associated buses shall be checked to be energized daily.

within 24 hours and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours

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LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.D. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generator is INOPERABLE, continued reactor operation is permissible during the succeeding 7 days, provided that 2 offsite power sources are available as specified in 3.9.A.1.c and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three units 1 and 2 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the cold condition within 24 hours.
4. When one units 1 and 2 4-kV shutdown board is INOPERABLE, continued reactor operation is permissible for a period of 5 days provided that 2 offsite power sources are available as specified in 3.9.A.1.c and the remaining 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and containment cooling) systems, and all 480-V emergency power boards are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the cold condition within 24 hours.

4.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generators is found to be INOPERABLE, all of the CS, RHR (~~LPCI and containment cooling~~) systems and the remaining diesel generators and ~~associated boards~~ shall be demonstrated to be OPERABLE ~~immediately and daily~~ thereafter.

within 24 hours and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours

4. When one 4-kV shutdown board is found to be INOPERABLE, all ~~remaining 4-kV shutdown boards and associated diesel generators, CS, and RHR (LPCI and containment cooling)~~ *associated* systems ~~supplied by~~ *with* the remaining 4-kV shutdown boards shall be demonstrated to be operable ~~immediately and daily~~ thereafter.

within 24 hours and power availability for the remaining 4-kV shutdown boards shall be verified within 1 hour and at least once per 8 hours

LIMITING CONDITIONS FOR OPERATION:

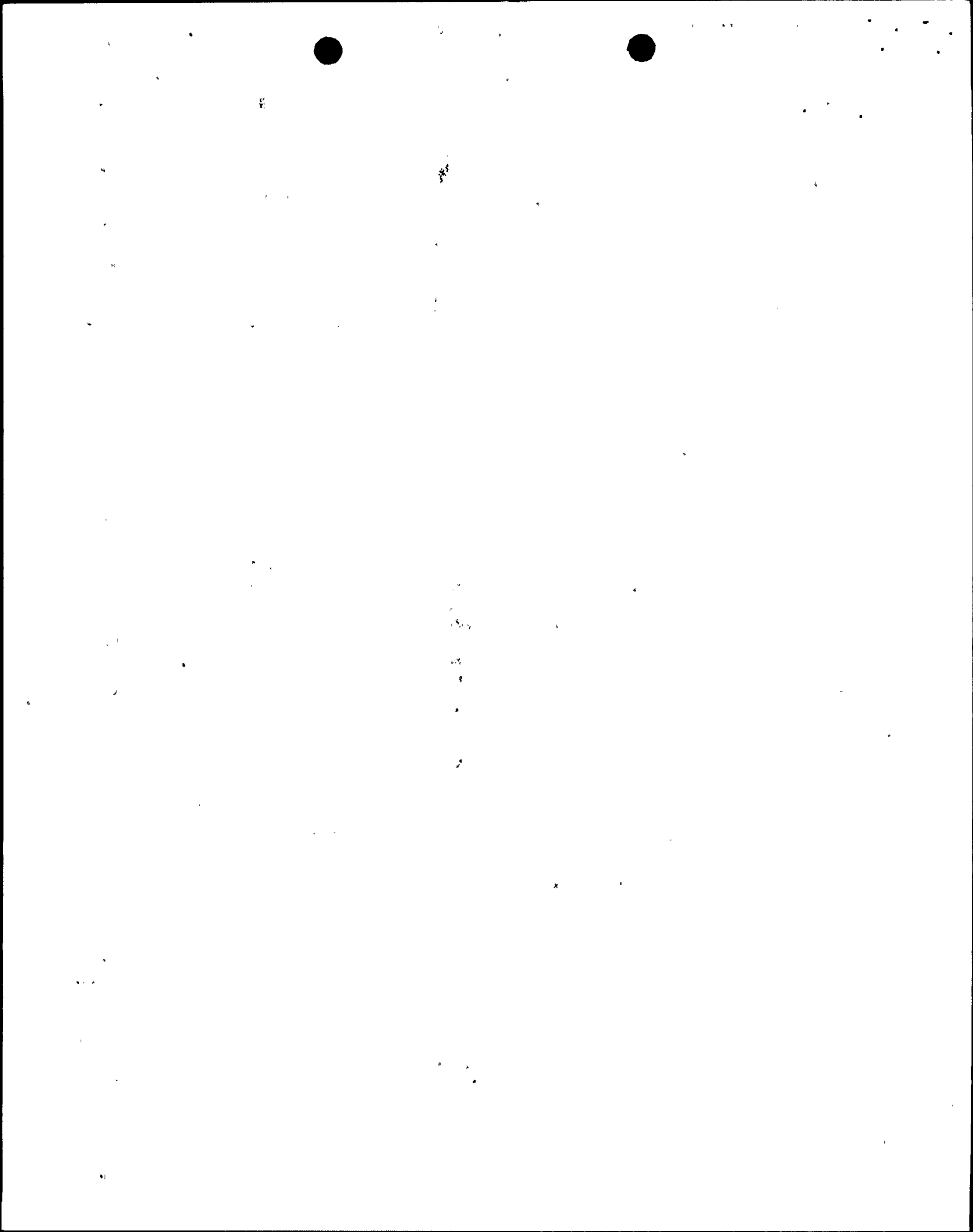
3.9.B. Operation With Inoperable Equipment

5. When one of the shutdown buses is INOPERABLE, reactor operation is permissible for a period of 7 days.
6. When one of the 480-V diesel auxiliary boards becomes INOPERABLE, reactor operation is permissible for a period of 5 days.
7. From and after the date that one of the three 250-V unit batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued reactor operation is permissible during the succeeding 7 days. Except for routine surveillance testing, NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

SURVEILLANCE REQUIREMENTS:

4.9.B. Operation With Inoperable Equipment

5. When a shutdown bus is found to be INOPERABLE, all 1 and 2 diesel generators shall be proven OPERABLE ~~immediately and daily thereafter~~ *within 24 hours.*
6. When one units 1 and 2 diesel auxiliary board is found to be INOPERABLE, the ~~remaining diesel auxiliary board and each unit 1 and 2 diesel generator shall be proven OPERABLE immediately and daily thereafter.~~ *within 24 hours and power availability for the remaining diesel auxiliary board shall be verified within 1 hour and at least once per 8 hours*



3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation with Inoperable Equipment

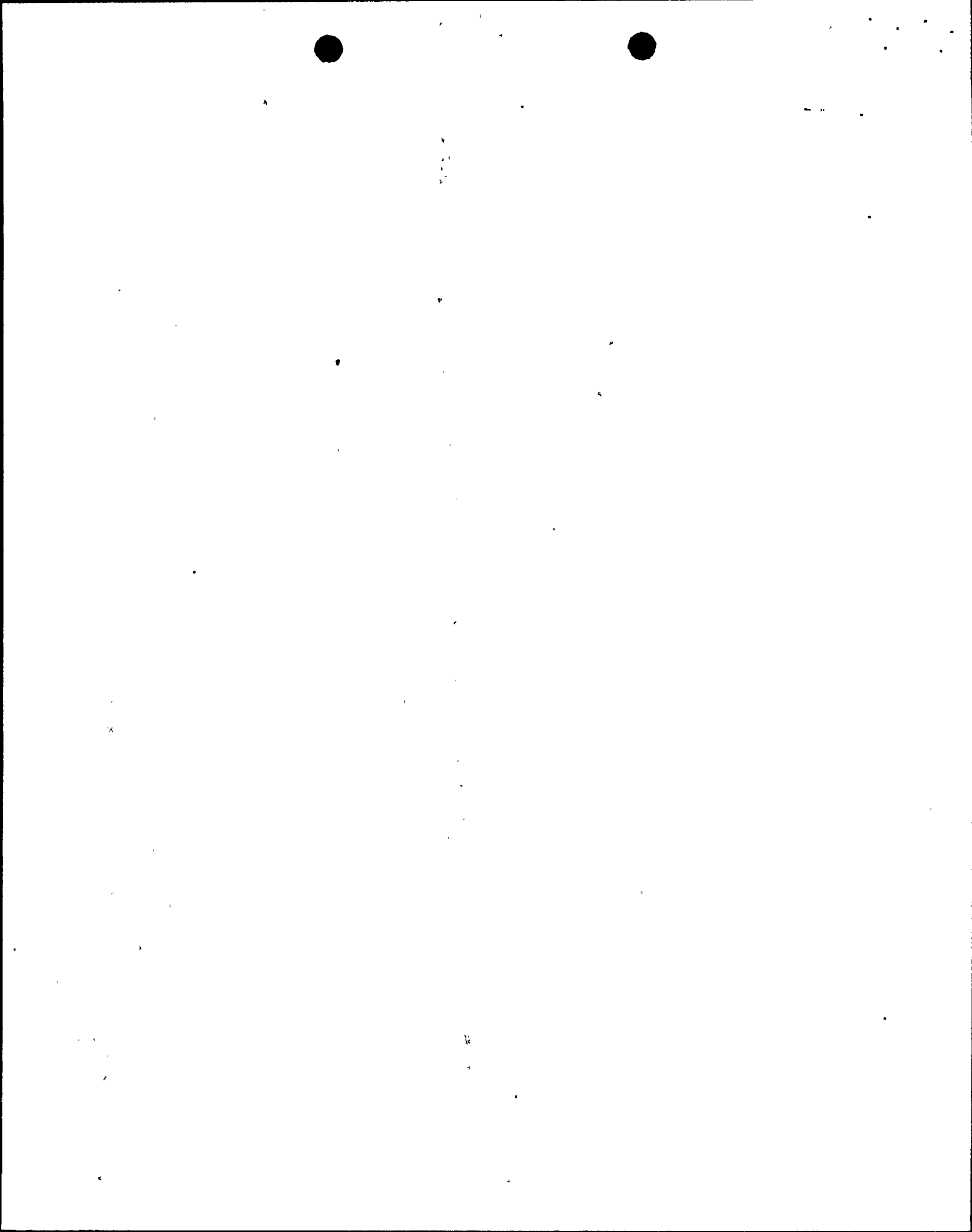
Whenever the reactor is in STARTUP mode or RUN mode and not in a cold condition, the availability of electric power shall be as specified in 3.9.A except as specified herein.

1. From and after the date that only one offsite power source is available, reactor operation is permissible for 7 days.
2. From and after the date that the 4-kV bus tie board becomes INOPERABLE, reactor operation is permissible indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all units 1 and 2 diesel generators and ~~associated boards~~ must be demonstrated to be OPERABLE ~~immediately and daily~~ thereafter.
2. When a required offsite power source is unavailable to unit 1 because the 4-kV bus tie board or a start bus is INOPERABLE, all unit 1 and 2 diesel generators and ~~associated boards~~ shall be demonstrated OPERABLE ~~immediately and daily~~ thereafter. The remaining offsite source and associated buses shall be checked to be energized daily.

within 24 hours and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours



LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generator is INOPERABLE, continued reactor operation is permissible during the succeeding 7 days, provided that 2 offsite power sources are available as specified in 3.9.A.1.c and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three units 1 and 2 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the cold condition within 24 hours.
4. When one units 1 and 2 4-kV shutdown board is INOPERABLE, continued reactor operation is permissible for a period of 5 days provided that 2 offsite power sources are available as specified in 3.9.A.1.c and the remaining 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and containment cooling) systems, and all 480-V emergency power boards are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the cold condition within 24 hours.

4.9.B. Operation With Inoperable Equipment

3. When one of the units 1 and 2 diesel generators is found to be INOPERABLE, all of the ~~CS, RHR (LPCI and containment cooling) systems and the~~ remaining diesel generators and ~~associated boards~~ shall be demonstrated to be OPERABLE immediately and daily thereafter.

within 24 hours and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours

4. When one 4-kV shutdown board is found to be INOPERABLE, all ~~remaining 4-kV shutdown boards and associated diesel generators, CS, and RHR (LPCI and containment cooling) systems~~ supplied by the remaining 4-kV shutdown boards shall be demonstrated to be operable immediately and daily thereafter.

within 24 hours and power availability for the remaining 4-kV shutdown boards shall be verified within 1 hour and at least once per 8 hours

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation With Inoperable Equipment

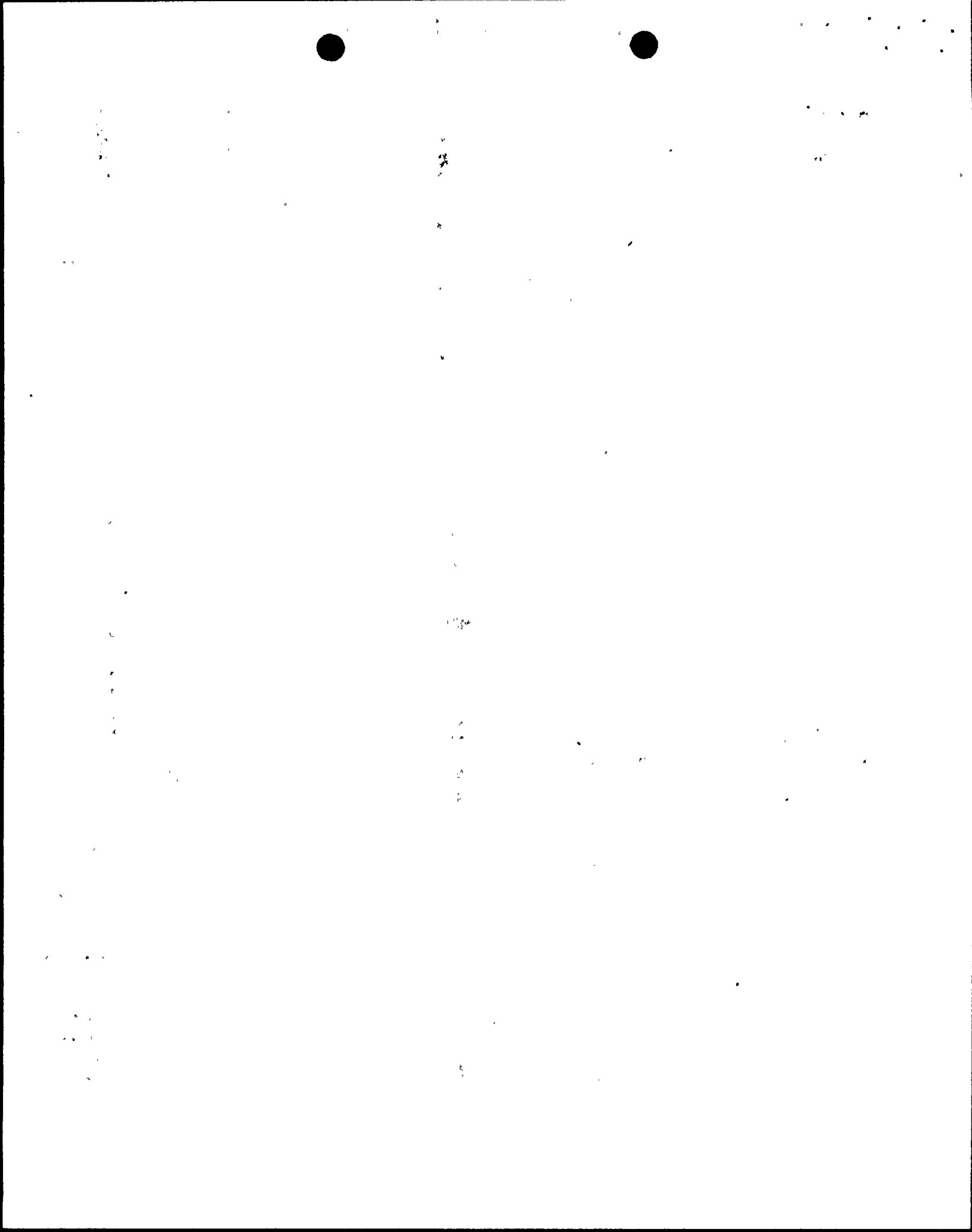
5. When one of the shutdown buses is INOPERABLE, reactor operation is permissible for a period of 7 days.
6. When one of the 480-V diesel auxiliary boards becomes INOPERABLE, reactor operation is permissible for a period of 5 days.
7. From and after the date that one of the three 250-V unit batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued reactor operation is permissible during the succeeding 7 days. Except for routine surveillance testing, NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

4.9.B. Operation With Inoperable Equipment

5. When a shutdown bus is found to be INOPERABLE, all 1 and 2 diesel generators shall be proven OPERABLE ~~immediately and daily thereafter.~~ *within 24 hours*

6. When one units 1 and 2 diesel auxiliary board is found to be INOPERABLE, the ~~remaining diesel auxiliary board and each unit 1 and 2 diesel generator shall be proven OPERABLE immediately and daily thereafter.~~

within 24 hours and power availability for the remaining diesel auxiliary board shall be verified within 1 hour and at least once per 8 hours



3.9/4.9. AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation with Inoperable Equipment

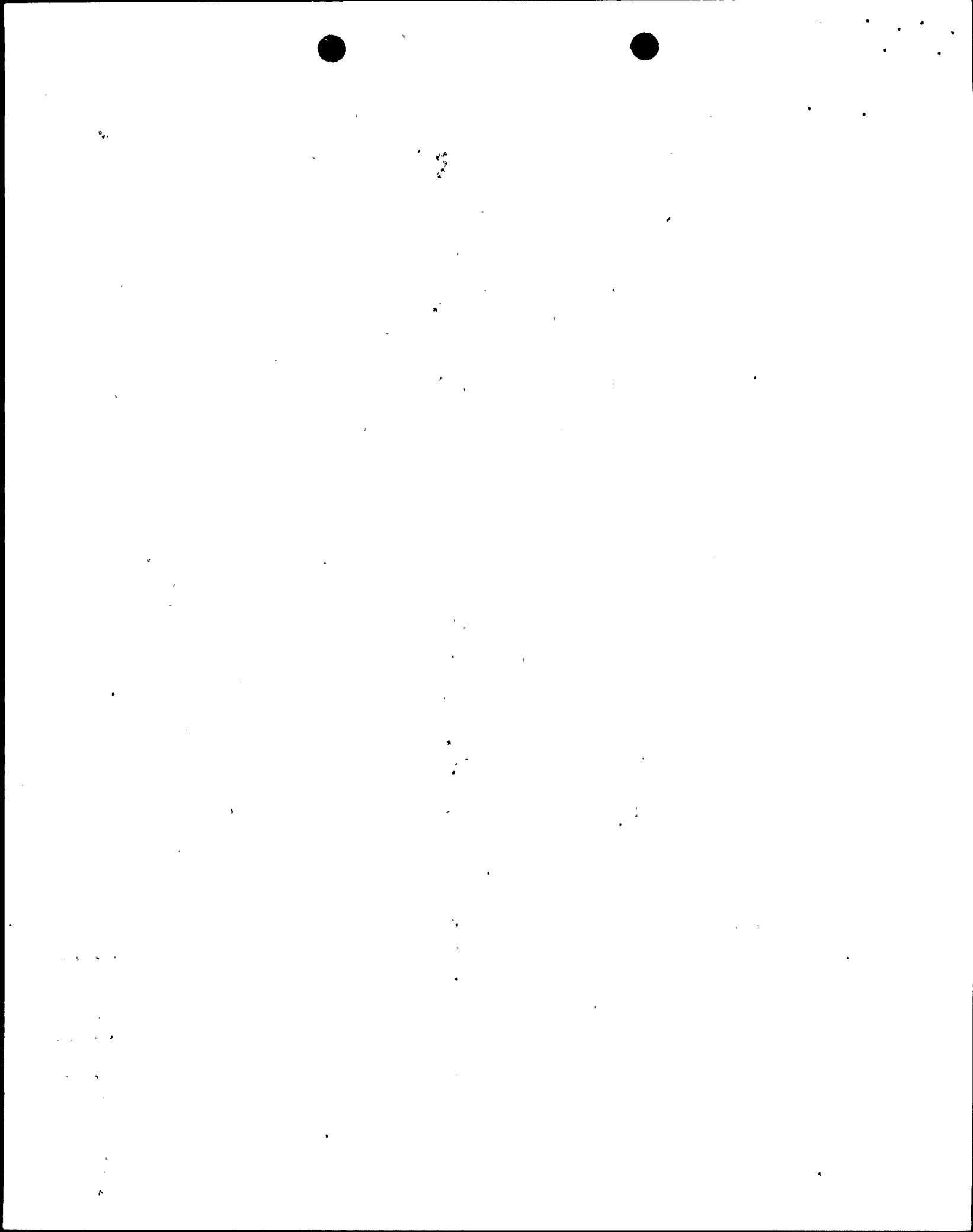
Whenever the reactor is in STARTUP mode or RUN mode and not in a Cold Condition, the availability of electric power shall be as specified in 3.9.A except as specified herein.

1. From and after the date that only one offsite power source is available, reactor operation is permissible under this condition for seven days.
2. When one unit 3 diesel generator (3A, 3B, 3C, or 3D) is INOPERABLE, continued reactor operation is permissible during the succeeding 7 days, provided that two offsite power sources are available as specified in 3.9.A.1.c., and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three unit 3 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the Cold Condition within 24 hours.

4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all unit 3 diesel generators and associated boards must be demonstrated to be OPERABLE immediately and daily thereafter.
2. When one unit 3 diesel generator is found to be INOPERABLE, all of the CS, RHR (LPCI and containment cooling) systems and the remaining unit 3 diesel generators and associated boards shall be demonstrated to be OPERABLE immediately and daily thereafter.

within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours



LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE-REQUIREMENTS

3.9.B. Operation With Inoperable Equipment

3. From and after the date that the 4-kV bus tie board becomes inoperable, reactor operation is permissible indefinitely provided one of the required offsite power sources is not supplied from the 161-kV system through the bus tie board.

4. When one unit 3 4-kV shutdown board is INOPERABLE, continued reactor operation is permissible for a period of 5 days provided that 2 offsite power sources are available as specified in 3.9.A.1.c and the remaining unit 3 4-kV shutdown boards and associated diesel generators, CS, RHR (LPCI and containment cooling) systems, and all unit 3 480-V emergency power boards are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the Cold Condition within 24 hours.

4.9.B. Operation With Inoperable Equipment

3. When a required offsite power source is unavailable because the 4-kV bus tie board or a start bus is INOPERABLE, all unit 3 diesel generators and associated boards shall be demonstrated OPERABLE immediately and daily thereafter. The remaining offsite source and associated buses shall be checked to be energized daily.

4. When one unit 3 4-kV shutdown board is found to be INOPERABLE, all remaining unit 3 4-kV shutdown boards and associated diesel generators, CS, and RHR (LPCI and *associated* containment cooling) *with* systems supplied by the remaining 4-kV shutdown boards shall be demonstrated to be OPERABLE, immediately and daily thereafter.

within 24 hours and power availability for the remaining 4-kV shutdown boards shall be verified within 1 hour and at least once per 6 hours

within 24 hours and power availability for the associated boards shall be verified within 1 hour and at least once per 6 hours



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LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B. Operation With Inoperable Equipment

5. From and after the date that one of the 480-V, diesel auxiliary boards becomes INOPERABLE, reactor operation is permissible for a period of 5 days.
6. From and after the date that the 250-V shutdown board 3EB battery or one of the three 250-V unit batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued reactor operation is permissible during the succeeding seven days. Except for routine surveillance testing, the NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.
7. When one division of the logic system is INOPERABLE, continued reactor operation is permissible under this condition for seven days, provided the CSCS requirements listed in Specification 3.9.B.2 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.

4.9.B. Operation With Inoperable Equipment

5. When one 480 V diesel auxiliary board is found INOPERABLE, ~~the remaining diesel auxiliary board and each unit 3 diesel shall be verified OPERABLE immediately and daily thereafter.~~

→ within 24 hours and power availability for the remaining diesel auxiliary board shall be verified within 1 hour and at least once per 8 hours.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.1.c. (Cont'd)

- (2) The 500-kV system is available to the units 1 and 2 shutdown boards through the unit 2 station-service transformer TUSS 2B with no credit taken for the two 500-kV Trinity lines. If the unit 1 station-service transformer is the second choice, a minimum of two 500-kV lines must be available.
- (3) The Trinity 161-kV line is available to the units 1 and 2 shutdown boards through both common station-service transformers.

NOTES FOR (3):

- (a) If unit 3 is claiming the Trinity line as an offsite source, see unit 3 technical specifications, section 3.9.A.1.c.2.
- (b) If unit 1 is in cold shutdown, only one common station-service transformer is required.
- (4) The Athens 161-kV line is available to the units 1 and 2 shutdown boards through a common station-service transformer when unit 1 is in Cold Shutdown and unit 3 is not claiming the Athens line as an offsite source.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.1. (Cont'd)

h. Once per operating cycle, a test will be conducted simulating a loss of offsite power and similar conditions that would exist with the presence of an actual safety-injection signal to demonstrate the following:

- (1) Deenergization of the emergency buses and load shedding from the emergency buses.
- (2) The diesel starts from ambient condition on the auto-start signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through load sequencing, and operates for greater than or equal to five minutes while its generator is loaded with the emergency loads.
- (3) On diesel generator breaker trip, the loads are shed from the emergency buses, and the diesel ~~restarts on the auto-start signal~~, the emergency buses are energized with

output breaker recloses on



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ENCLOSURE 2

DESCRIPTION AND JUSTIFICATION BROWNS FERRY NUCLEAR PLANT (BFN)

Description of Change

Technical specifications 4.9.B.1, 2, 3, 4, 5, and 6 require the remaining diesel generators and associated boards to be tested "immediately and daily thereafter" whenever a diesel generator or other electrical equipment is inoperable. Specifications 4.9.B.3 and 4 also require testing of the Core Spray (CS) System, the low pressure coolant injection, and the containment cooling modes of the Residual Heat Removal (RHR) System. This proposed change would require the diesel generators to be demonstrated operable within 24 hours and power availability of the associated boards to be verified within one (1) hour and at least once per eight (8) hours thereafter. The revised specifications would not require any additional testing of the Emergency Core Cooling Systems (ECCS).

Technical specification 4.9.A.1.b(3) is changed to correct an editorial error.

Reason for Change

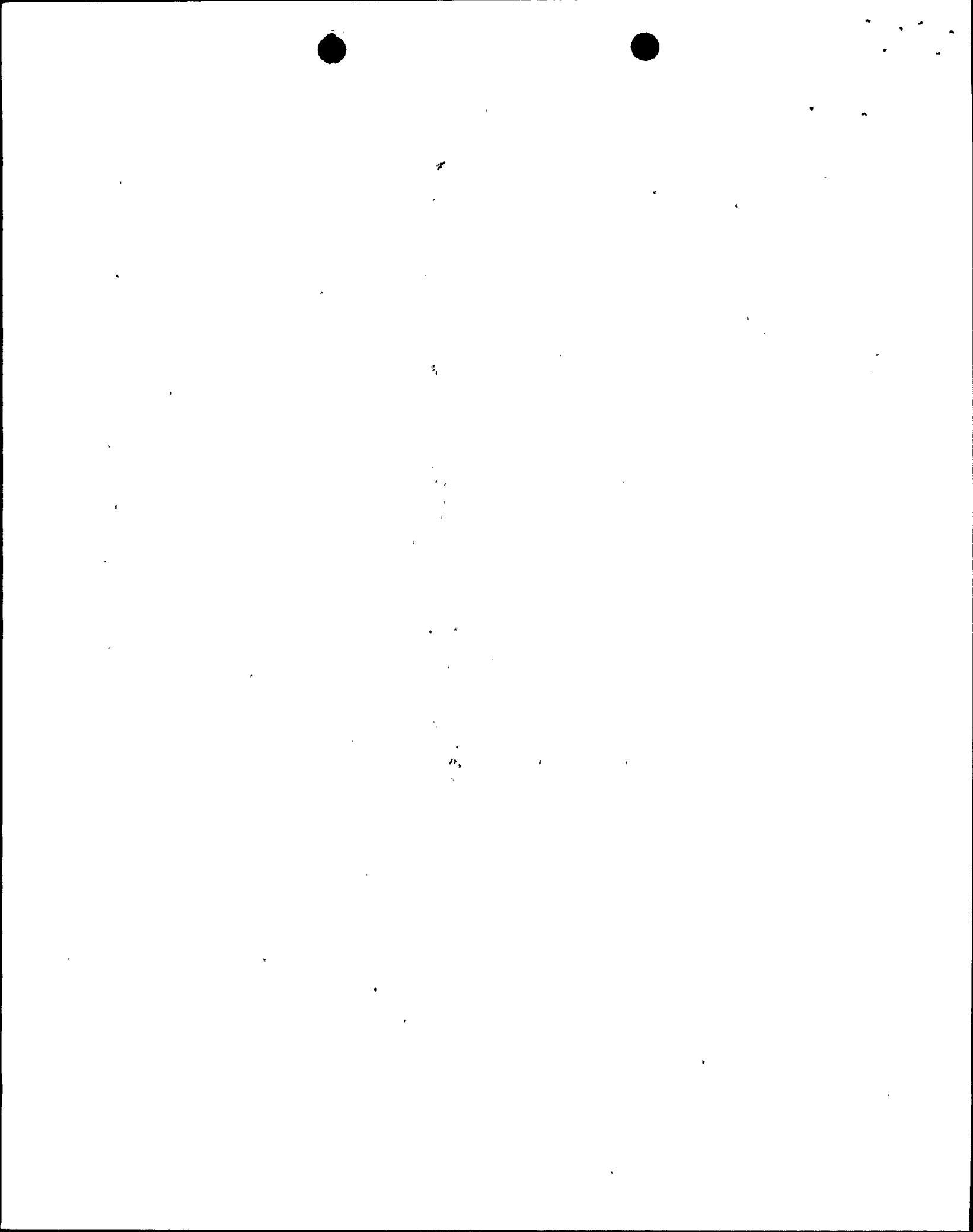
NRC Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," recommended that the technical specifications be amended to reduce excessive diesel generator starts due to their adverse effect on reliability. BFN technical specification amendment request 231 dated May 29, 1987 was submitted to implement the recommendations of Generic Letter 84-15. This supplemental response to BFN-TS 231 at the request of NRC increases the frequency of verification of the associated boards to ensure power availability, reduces excessive testing of the EECS due to its adverse effect on reliability and further reduces required diesel starts.

In reviewing the diesel generator section of the technical specifications, an editorial error was found in technical specification 4.9.A.1.b(3) in that the words "restarts on" should be replaced by "output breaker recloses on."

Justification for Change

The safety objective of the Standby A-C Power System is to provide a self-contained, highly reliable source of power so that no single credible event can disable the core standby cooling functions or their supporting auxiliaries. Eight generators, (four total shared by units 1 and 2, and four for unit 3) are provided as a standby power supply to be used on loss of the normal auxiliary power system. Each of the diesel generators is assigned primarily to one 4.16-kV shutdown board. It is possible, through breaker ties to the shutdown buses, to make connections between units 1, 2, and 3 diesel generators allowing for flexibility in load distribution. All ac equipment necessary for the safe shutdown of the plant under accident or nonaccident conditions is fed from this distribution system.

For the long term (greater than 10 minutes), the Standby Power System is designed so that three of the units 1 and 2 diesel generators, paralleled with three unit 3 diesel generators, are adequate to supply all required loads for the safe shutdown and cooldown of all three units in the event of loss of offsite power and a design basis accident in one unit.



Justification for Change (Cont'd)

The technical specifications currently contain requirements that have been determined by Generic Letter 84-15 to be detrimental to the performance of the onsite emergency electrical power system. Therefore, the proposed changes to the technical specifications are to provide the improvements which are recommended by Generic Letter 84-15 to enhance the reliability of the diesel generators.

The current technical specifications require that every diesel be tested "immediately" whenever other power sources are declared inoperable. This requirement subjects the diesel engine to undue wear and stress on the engine parts. To be consistent with the philosophy of reducing excessive testing and thereby enhancing the reliability of the diesel generator, TVA proposes that when the other power sources listed in the technical specifications are declared inoperable, the remaining diesels be demonstrated operable within 24 hours and the associated boards verified operable within one hour and every eight hours thereafter. A 24-hour interval will reduce unnecessary starting and stopping of equipment and will also eliminate abusive fast diesel startups and stops that are presently required to test the diesels immediately. The associated boards will be verified by verifying correct breaker alignment and indicated power availability. The increased verification frequency on the associated electrical boards will provide verification of availability and not adversely effect equipment or significantly consume operator time, since these surveillances can be performed from the main control room without actuating any mechanical equipment. These changes are consistent with the guidance given in Generic Letter 84-15.

Deleting the conditional testing of the RHR and CS Systems when an electrical component fails will not reduce safety since failures experienced in one train of the electrical system have no mechanistic connection with performance of operable equipment supplied by other sources of electrical power. Such testing may be detrimental to reliability and availability due to excessive equipment starts, and test produced failures and unavailabilities. Furthermore, significant operator attention must be devoted to running these tests and realigning the system after the test. The increased surveillance of the associated boards will provide additional assurance that power will be available to this equipment if needed, without effecting the equipment or power supply.

A related change being corrected as part of this amendment is an editorial error on technical specification 4.9.A.1(3). Final Safety Analysis Report section 8.5.5 correctly states that if an accident occurs during a diesel test the diesel output breaker trips but the diesel remains running and available for service. The technical specification surveillance requirement incorrectly states that the diesel restarts.

The proposed changes to BFN units 1, 2, and 3 Technical Specifications are consistent with Generic Letter 84-15. They provide positive improvements to diesel generator reliability. For these reasons, TVA has concluded that the proposed changes to the technical specifications will not reduce the margin of plant safety.

