3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System, and

b. Two separate and independent diesel generators, each with:

1) A separate day tank containing a minimum volume of 445 gallons of fuel,

2) A separate Fuel Storage System containing a minimum volume of 74,700 gallons of fuel,

3) A separate fuel transfer valve, and

4) A separate 125 VDC battery and charger connected to the diesel generator control loads.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With an offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. sources by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter, also demonstrate the OPERABILITY of both diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4) within 24 hours unless the diesels are operating; restore the inoperable offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. source by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter, also demonstrate the OPERABILITY of the remaining diesel generator by performing Surveillance Requirement 4.8.1.1.2a.4) within 8 hours, unless the diesel is operating; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With the diesel generator restored to OPERABLE status follow ACTION a.; with

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

the offsite A.C. source restored to OPERABLE status follow ACTION d.

c. With one diesel generator inoperable in addition to ACTION a. or b. above, verify that:

1. All required systems, subsystems, trains, components and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and

2. When in MODE 1, 2 or 3 with a steam pressure greater than 900 psig, the steam-driven auxiliary feedwater pump is OPERABLE.

If these conditions are not satisfied within 2 hours be in a least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With a diesel generator of the above required A.C. electrical power sources inoperable,* demonstrate the OPERABILITY of the offsite A.C. sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and unless the inoperability of the diesel was due to preplanned testing or maintenance, demonstrate the OPERABILITY of the remaining diesel generator by performing Surveillance Requirement 4.8.1.1.2a.4) within 24 hours unless the diesel generator is already operating; restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. At the number of failures for the inoperable diesel indicated in Table 4.8-1a perform the Additional Reliability Actions prescribed in Table 4.8-1a and its attachments.

e. With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of each of the diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4) within 8 hours unless the diesel generators are already operating; restore at least one of the inoperable offsite sources to OPERABLE status wthin 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow ACTION a.

f. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at

*A diesel generator shall be considered to be inoperable from the time of failure until it satisfies the requirements of Surveillance Requirement 4.8.1.1.2a.4).

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With one diesel generator restored to OPERABLE status, follow ACTION d.

g. With a diesel generator operating at greater than 5750 kW, within 1 hour reduce the diesel generator output to less than or equal to 5750 kW.

h. With the Cathodic Protection System inoperable, restore the System to OPERABLE status within 10 days or prepare and submit within 14 days a Special Report pursuant to Specification 6.9.2 outlining the cause of the inoperability and the plans to restoring the System to OPERABLE.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and

b. Demonstrated OPERABLE at least once per 18 months by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

1) Verifying the fuel level in the day tank,

2) Verifying the fuel level in the fuel storage tank,

3) Verifying the fuel transfer valve can be operated to allow fuel to be transferred from the storage system to the day tank,

SURVEILLANCE REQUIREMENTS (Continued)

4) Verifying the diesel starts from ambient condition and accelerates to at least 441 rpm in less than or equal to 11 seconds.* The generator voltage and frequency shall be 4160 volts ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

a) Manual, or

b) Simulated loss of offsite power by itself, or

c) Simulated loss of offsite power in conjunction with an ESF Actuation test signal, or

d) An ESF Actuation test signal by itself.

5) Verifying the generator is synchronized, loaded to greater than or equal to 5600 kW but less than or equal to 5750 kW in less than or equal to 60 seconds, and operates for at least 60 minutes, and

6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day tank;

c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;

d. By verifying that the Cathodic Protection System is OPERABLE by verifying:

1) At least once per 60 days that cathodic protection rectifiers are OPERABLE and have been inspected in accordance with the manufacturer's inspection procedures, and

*The diesel generator start (11 sec.) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical stress and wear on the diesel engine is minimized.

2) At least once per 12 months that adequate protection from corrosion is provided in accordance with manufacturer's inspection procedures.

e. By sampling new fuel oil in accordance with ASTM-D4057 prior to addition to storage tanks and:

1) By verifying in accordance with the tests specified in ASTM-D975-81 prior to addition to the storage tanks that the sample has:

a) An API Gravity of within 0.3 degrees at 60°F, or a specific gravity of within 0.0016 at 60/60°F, when compared to the supplier's certificate, or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89, or an API gravity of greater than or equal to 27 degrees but less than or equal to 39 degrees;

b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6, but less than or equal to 40.1), if gravity was not determined by comparison with the supplier's certification;

c) A flash point equal to or greater than 125°F; and

d) A clear and bright appearance with proper color when tested in accordance with ASTM-D4176-82.

2) By verifying within 30 days of obtaining the sample that the other properties specified in Table 1 of ASTM-D975-81 are met when tested in accordance with ASTM-D975-81 except that the analysis for sulfur may be performed in accordance with ASTM-D1552-79 or ASTM-D2622-82.

f. At least once every 31 days by obtaining a sample of fuel oil in accordance with ASTM-D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM-D2276-78, Method A;

g. At least once per 18 months by:

1) Subjecting the diesel to an inspection, during shutdown, in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;

SURVEILLANCE REQUIREMENTS (Continued)

2) Verifying the generator capability to reject a load of greater than or equal to 825 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;

3) Verifying the generator capability to reject a load of greater than or equal to 5600 kW but less than or equal to 5750 kW without tripping. The generator speed shall not exceed 500 rpm during and following the load rejection;

4) Simulating a loss-of-offsite power by itself, during shutdown, and:

   a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and

   b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.

5) Verifying that on an ESF Actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test;

6) Simulating a loss-of-offsite power in conjunction with an ESF Actuation test signal, during shutdown, and

   a) Verifying deenergization of the emergency busses and load shedding from the emergency busses;

   b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test; and

SURVEILLANCE REQUIREMENTS (Continued)

c) Verifying that all automatic diesel generator trips, except engine overspeed, low-low lube oil pressure, generator differential, and the 2 out of 3 voltage controlled overcurrent relay scheme, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.

7) Verifying, during shutdown, the diesel generator operates for at least 24 hours. The diesel generator shall be loaded to greater than or equal to 5600 kw but less than or equal to 5750 kW. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Specification 4.8.1.1.2g.6)b);*

8) Verifying, during shutdown, that the auto-connected loads to each diesel generator do not exceed 5750 kW;

9) Verifying, during shutdown, the diesel generator's capability to:

   a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,

   b) Transfer its loads to the offsite power source, and

   c) Be restored to its standby status.

10) Verifying, during shutdown, that with the diesel generator operating in a test mode, connected to its bus, a simulated Safety Injection signal overrides the test mode by: (1) returning the diesel generator to standby operation, and (2) automatically energizing the emergency loads with offsite power;

11) Verifying that the fuel transfer valve transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross-connection lines;

*If Specification 4.8.1.1.2g.6)b) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at greater than or equal to 5600 kW but less than or equal to 5750 kW for 1 hour or until operating temperature has stabilized.

12) Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within the tolerances shown in Table 4.8-2;

13) Verifying that the voltage and diesel speed tolerances for the accelerated sequencer permissives are 92.5 ± 1% and 98 + 1%, respectively, with a minimum time delay of 2 ± 0.2 s; and

14) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:

a) Turning gear engaged, or

b) Maintenance mode.

h. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 441 rpm in less than or equal to 11 seconds; and

i. At least once per 10 years by:

1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution or its equivalent,

2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure, and

3) Performing tank wall thickness measurements. The resulting data shall be evaluated and any abnormal degradation will be justified or corrected. Any abnormal degradation will be documented in a report to the Commission.

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported in a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

4.8.1.1.4 Diesel Generator Batteries - Each diesel generator 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

SURVEILLANCE REQUIREMENTS (Continued)

1) The electrolyte level of each battery is at or above the low mark and at or below the high mark,

2) The overall battery voltage is greater than or equal to 125 volts on float charge, and

3) The individual cell voltage is greater than or equal to 1.36 volts on float charge.*

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1) There is no visible corrosion at either terminals or connectors, and

2) The average electrolyte temperature of six connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,

2) The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anticorrosion material in accordance with manufacturer's recommendations,

3) The cell-to-cell pole screws torque setting is 14.5 ± 0.5 ft-lbs,

4) The battery charger will supply at least 75 amperes at a minimum of 125 volts for at least 8 hours, and

5) The battery capacity is adequate to supply and maintain in OPERABLE status its emergency loads when subjected to a battery service test. The battery shall supply a current of greater than or equal to 171.6 amps for the first minute and a current of greater than or equal to 42.5 amps for the remaining 119 minutes, while maintaining a terminal voltage of greater than or equal to 105 volts.

d. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when

*Two different cells shall be tested each month.

SURVEILLANCE REQUIREMENTS (Continued)

subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test.*

e. At least once per 18 months, during shutdown, by giving performance discharge tests of battery capacity to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

*First test to be conducted within 60 months following OL issuance date.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

NUMBER OF FAILURES IN LAST 20 VALID TESTS*	TEST FREQUENCY
≤ 1	At least once per 31 days
≥ 2	At least once per 7 days**

*Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, August 1977, where the number of tests and failures is determined on a per diesel generator basis. For the purposes of this test schedule, only valid tests conducted after the OL issuance date shall be included in the computation of the "last 20 valid tests." Entry into this test schedule shall be made at the 31 day test frequency. Any successful demonstration of 4.8.1.1.2g.4)a) and b) or 4.8.1.1.2g.6)a) and b) whether simulated or actual will be classified as a valid successful test.

**This test frequency shall be maintained until seven consecutive failure free tests have been performed and the number of failures in the last 20 valid tests has been reduced to one or less.

TABLE 4.8-1a

ADDITIONAL RELIABILITY ACTIONS

No. of failures in the last 20 valid tests	or	100 valid tests	Action
3		6	Within 14 days prepare and maintain a report for NRC audit describing the diesel generator reliability improvement program implemented at the site. Minimum requirements for the report are indicated in Attachment 1 to this table.
5		11	Declare the diesel generator inoperable. Perform a requalification test program for the affected diesel generator. Requalification test program requirements are indicated in Attachment 2 to this table.

ATTACHMENT 1 TO TABLE 4.8-1a

REPORTING REQUIREMENT

As a minimum the Reliability Improvement Program report for NRC audit shall include:

a) a summary of all tests (valid and invalid) that occurred within the time period over which the last 20/100 valid tests were performed

b) analysis of failures and determination of root causes of failures

c) evaluation of each of the recommendations of NUREG/CR-0660, "Enhancement of Onsite Emergency Diesel Generator Reliability in Operating Reactors," with respect to their application to the Plant

d) identification of all actions taken or to be taken to 1) correct the root causes of failures defined in b) above and 2) achieve a general improvement of diesel generator reliability

e) the schedule for implementation of each action from d) above

f) an assessment of the existing reliability of electric power to Engineered-Safety-Feature equipment

Once a licensee has prepared and maintained an initial report detailing the diesel generator reliability improvement program at his site, as defined above, the licensee need prepare only a supplemental report within 14 days after each failure during a valid test for so long as the affected diesel generator unit continues to violate the criteria (3/20 or 6/100) for the reliability improvement program remedial action. The supplemental report need only update the failure/test history for the affected diesel generator unit since the last report for that diesel generator. The supplemental report shall also present an analysis of the failure(s) with a root cause determination, if possible, and shall delineate any further procedural, hardware or operational changes to be incorporated into the site diesel generator improvement program and the schedule for implementation of those changes.

In addition to the above, submit a yearly data report on the diesel generator reliability.

ATTACHMENT 2 TO TABLE 4.8-1a
DIESEL GENERATOR REQUALIFICATION PROGRAM

(1) Perform seven consecutive successful tests without a failure within 30 days of the diesel generator being restored to OPERABLE status and fourteen consecutive successful tests without a failure within 75 days of the diesel generator being restored to OPERABLE status.

(2) If a failure occurs during the first seven tests in the requalification test program, perform seven successful tests without an additional failure within 30 days of the diesel generator being restored to OPERABLE status and fourteen consecutive successful tests without a failure within 75 days of being restored to OPERABLE status.

(3) If a failure occurs during the second seven tests (tests 8 through 14) of (1) above, perform fourteen consecutive successful tests without an additional failure within 75 days of the failure which occurred during the requalification testing.

(4) During requalification testing the diesel generator shall not be conducted more frequently than at 24-hour intervals.

After a diesel generator has been successfully requalified, subsequent repeated requalification tests will not be required for that diesel generator under the following conditions:

(a) The number of failures in the last 20 valid tests is less than 5.

(b) The number of failures in the last 100 valid tests is less than 11.

(c) In the event that following successful requalification of a diesel generator, the number of failures is still in excess of the remedial action criteria (a and/or b above) the following exception will be allowed until the diesel generator is no longer in violation of the remedial action criteria (a and/or b above).

Requalification testing will not be required provided that after each valid test the number of failures in the last 20 and/or 100 valid tests has not increased. Once the diesel generator is no longer in violation of the remedial action criteria above the provisions of those criteria alone will prevail.

TABLE 4.8-2

LOAD SEQUENCING TIMES

Load Group Number	Sequence Time (Seconds)
Initiate Timer (T_o)	9.7 ± 0.3
1 (T_1)	T_o + 0.9 ± 0.1
2 (T_2)	T_o + 1.9 ± 0.1
3 (T_3)	T_o + 4.7 ± 0.3
4 (T_4)	T_o + 9.4 ± 0.6
5 (T_5)	T_o + 14.1 ± 0.9
6 (T_6)	T_o + 18.8 ± 1.2
7 (T_7)	T_o + 23.5 ± 1.5
8 (T_8)	T_o + 28.2 ± 1.8
9 (T_9)	T_o + 37.6 ± 2.4
10 (T_{10})	T_o + 47.0 ± 3.0
11 (T_{11})	T_o + 555.0 ± 35.0
12 (T_{12})	T_{11} + 56.4 ± 3.6
13 (T_{13})	T_{11} + 112.8 ± 7.2

3/4.8.1, 3/4.8.2 and 3/4.8.3 A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for: (1) the safe shutdown of the facility, and (2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix A to 10 CFR 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources", December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term, verify, as used is this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component. The ACTION requirements for diesel generator testing in the event of the inoperability of other electric power sources also reflect the potential for degradation of the diesel generator due to excessive testing. This concern has developed, concurrently with increased industry experience with diesel generators, and has been acknowledged by the NRC staff in Generic Letter 84-15.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that: (1) the facility can be maintained in the shutdown or refueling condition for extended time periods, and (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, Regulatory Guide 1.137, "Fuel-Oil Systems for Standby

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

Diesel Generators," Revision 1, October 1979, the NRC Staff Evaluation Report concerning the Reliability of Diesel Generators at Catawba, August 14, 1984 and Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability." If any other metallic structures (building, new or modified piping systems, conduits) are placed in the ground near the Fuel Oil Storage System or if the original system is modified, the adequacy and frequency of inspections for the Cathodic Protection System shall be reevaluated and adjusted in accordance with the manufacturer's recommendations.

A diesel declared inoperable as a result of the 5th failure in the last twenty starts, or the 11th failure in the last 100 starts, comes under the Requirements of the Diesel Generator Requalification Program. The diesel can be considered OPERABLE again under Technical Specifications by successfully carrying out each of the Surveillance Requirements of 4.8.1.1.2a.4). The provisions of Attachment 2 to Table 4.8-1a must then be complied with in the time frames specified or the diesel re-declared inoperable. Any failure which occurs during the requalificaiton program causes the diesel to be considered inoperable under Technical Specifications.

Successfully compieting Surveillance Requirement 4.8.1.1.2a.4) will be necessary to declare the diesel OPERABLE.

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

3/4.8.4 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

Containment electrical penetrations and penetration conductors are protected by either deenergizing circuits not required during reactor operation or by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers during periodic surveillance.

The Surveillance Requirements applicable to lower voltage circuit breakers and fuses provide assurance of breaker and fuse reliability by testing at least one representative sample of each manufacturer's brand of circuit breaker and/or fuse. Each manufacturer's molded case circuit breakers and/or fuses are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers and/or fuses are tested. If a wide variety exists within any manufacturer's brand of circuit breakers and/or fuses, it is necessary to divide that manufacturer's breakers and/or fuses into groups and treat each group as a separate type of breaker or fuse for surveillance purposes.

Attachment 2

Proposed Amendment to Catawba Unit 1
Technical Specifications 6.5, 6.6, 6.8 and 6.10.2.i Concerning
Administrative Controls

JUSTIFICATION AND ANALYSIS OF SIGNFICANT HAZARDS CONSIDERATION

The inclusion of the Superintendent of Integrated Scheduling in Specifications 6.5.1.3, 6.5.1.5, 6.6.1b, 6.8.2 and 6.8.3c is an administrative matter and involves no safety questions. The proposed changes would allow the Superintendent of Integrated Scheduling to review and/or approve modifications of safety-related structures, systems or components (6.5.1.3), proposed tests and experiments which affect nuclear safety and are not addressed in the FSAR or Technical Specification (6.5.1.5), REPORTABLE EVENTS (6.6.1b), and procedures specificed under Specification 6.8.1 and changes thereto (6.8.2 and 6.8.3c), if so designated by the Station Manager.

In each of the above cases, the Operating Superintendent, the Technical Services Superintendent and the Maintenance Superintendent each have the same authority as described above. Since the Superintendent of Integrated Scheduling is required to meet the same qualifications as each of these Superintendents, no loss of Technical Review Capability can occur, therefore there will be no impact on safety.

The proposed amendment to 6.8.1.c would allow the Superintendent of Station Services to review and approve security procedures. The Security Staff and the Security Plan implementation are the responsibility of the Superintendent of Station Services. The current Technical Specification does not allow this Superintendent to review and approve Station Security procedures.

The proposed amendment to 6.5.1.8 and 6.10.2.i would remove a regulatory inconsistency in that the Technical Specifications call for retaining certain QA records for the duration of the life of the unit, however Regulatory Guide 1.88 (which adopts ANSI N45.2.9-1074) allows different durations of retention for different records.

Catawba FSAR Table 1.8-1, page 35 discusses Duke Power's compliance with Regulatory Guide 1.88. Thus, the Technical Specifications should be changed to reflect this commitment.

10 CFR 50.92 states that a proposed amendment involves no significant hazards considerations if operation in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

The proposed amendments do not increase the probability or consequences of an accident previously evaluated and do not create the possibility of a new or different kind of accident in that they do not directly affect the operation of the unit.

The proposed amendments do not involve a significant reduction in a margin of safety since the amendments are only Administrative in nature. Therefore, Duke Power company concludes that the proposed amendments do not involve significant hazards considerations.

The Commission has provided guidance concerning the application of standards of no significant hazards determination by providing certain examples (48 CFR 14870). One of the examples of actions likely to involve no significant hazards considerations is a change that is purely administrative.

6.5 REVIEW AND AUDIT

6.5.1 TECHNICAL REVIEW AND CONTROL ACTIVITIES

6.5.1.1 Each procedure and program required by Specification 6.8 and other procedures which affect nuclear safety, and changes thereto, shall be prepared by a qualified individual/organization. Each such procedure, and changes thereto, shall be reviewed by an individual/group other than the individual/group which prepared the procedure, or changes thereto, but who may be from the same organization as the individual/group which prepared the procedure, or changes thereto.

6.5.1.2 Proposed changes to the Appendix A Technical Specifications shall be prepared by a qualified individual/organization. The preparation of each proposed Technical Specification change shall be reviewed by an individual/group other than the individual/group which prepared the proposed change, but who may be from the same organization as the individual/group which prepared the proposed change. Proposed changes to the Technical Specifications shall be approved by the Station Manager.

6.5.1.3 Proposed modifications to unit nuclear safety-related structures, systems, and components shall be designed by a qualified individual/organization. Each such modification shall be reviewed by an individual/group other than the individual/group which designed the modification, but who may be from the same organization as the individual/group which designed the modification. Proposed modifications to nuclear safety-related structures, systems, and components shall be approved prior to implementation by the Station Manager; or by the Operating Superintendent, the Technical Services Superintendent, ~~or~~ the Maintenance Superintendent, as previously designated by the Station Manager.

or the Superintendent of Integrated Scheduling,

6.5.1.4 Individuals responsible for reviews performed in accordance with Specifications 6.5.1.1, 6.5.1.2, and 6.5.1.3 shall be members of the station supervisory staff, previously designated by the Station Manager to perform such reviews. Review of environmental radiological analysis procedures shall be performed by the Corporate System Health Physicist or his designee. Each such review shall include a determination of whether or not additional, cross-disciplinary, review is necessary. If deemed necessary, such review shall be performed by the appropriate designated station review personnel.

6.5.1.5 Proposed tests and experiments which affect station nuclear safety and are not addressed in the FSAR or Technical Specifications shall be reviewed by the Station Manager; or by the Operating Superintendent, the Technical Services Superintendent, ~~or~~ the Maintenance Superintendent, as previously designated by the Station Manager.

or the Superintendent of Integrated Scheduling,

TECHNICAL REVIEW AND CONTROL ACTIVITIES (Continued)

6.5.1.6 All REPORTABLE EVENTS and all violations of Technical Specifications shall be investigated and a report prepared which evaluates the occurrence and which provides recommendations to prevent recurrence. Such reports shall be approved by the Station Manager and transmitted to the Vice President, Nuclear Production, and to the Director of the Nuclear Safety Review Board.

6.5.1.7 The Station Manager shall assure the performance of special reviews and investigations, and the preparation and submittal of reports thereon, as requested by the Vice President, Nuclear Production.

6.5.1.8 The station security program, and implementing procedures shall be reviewed at least once per 12 months. Recommended changes shall be approved by the ~~Station Manager~~ Superintendent of Station Services and transmitted to the Vice President, Nuclear Production, and to the Director of the Nuclear Safety Review Board.

6.5.1.9 The station emergency plan, and implementing procedures, shall be reviewed at least once per 12 months. Recommended changes shall be approved by the Station Manager and transmitted to the Vice President, Nuclear Production, and to the Director of the Nuclear Safety Review Board.

6.5.1.10 The Station Manager shall assure the performance of a review by a qualified individual/organization of every unplanned onsite release of radioactive material to the environs including the preparation and forwarding of reports covering evaluation, recommendations, and disposition of the corrective ACTION to prevent recurrence to the Vice President, Nuclear Production and to the Nuclear Safety Review Board.

6.5.1.11 The Station Manager shall assure the performance of a review by a qualifed individual/organization of changes to the PROCESS CONTROL PROGRAM, OFFSITE DOSE CALCULATION MANUAL, and Radwaste Treatment Systems.

6.5.1.12 Reports documenting each of the activities performed under Specifications 6.5.1.1 through 6.5.1.11 shall be maintained. Copies shall be provided to the Vice President, Nuclear Production, and the Nuclear Safety Review Board.

6.5.2 NUCLEAR SAFETY REVIEW BOARD (NSRB)

FUNCTION

6.5.2.1 The NSRB shall function to provide independent review and audit of designated activities in the areas of:

a. Nuclear power plant operations,

b. Nuclear engineering,

c. Chemistry and radiochemistry,

RECORDS (Continued)

b. Reports of reviews encompassed by Specification 6.5.2.8 above, shall be prepared, approved, and forwarded to the Vice President, Nuclear Production, and to the Executive Vice President, Power Operations, within 14 days following completion of the review; and

c. Audit reports encompassed by Specification 6.5.2.9 above, shall be forwarded to the Vice President, Nuclear Production, and to the Executive Vice President, Power Operations, and to the management positions responsible for the areas audited within 30 days after completion of the audit by the auditing organization.

6.6 REPORTABLE EVENT ACTION

6.6.1 The following actions shall be taken for REPORTABLE EVENTS:

a. The Commission shall be notified and a report submitted pursuant to the requirements of Section 50.73 to 10 CFR Part 50 and

b. Each REPORTABLE EVENT shall be reviewed by the Station Manager; or by (1) Operating Superintendent; (2) Technical Services Superintendent; ~~or~~ (3) Maintenance Superintendent; or (4) Superintendent of Integrated Scheduling, as previously designated by the Station Manager, and the results of this review shall be submitted to the NSRB and the Vice President-Nuclear Production.

6.7 SAFETY LIMIT VIOLATION

6.7.1 The following actions shall be taken in the event a Safety Limit is violated:

a. The NRC Operations Center shall be notified by telephone as soon as possible and in all cases within 1 hour. The Vice President-Nuclear Production and the NSRB shall be notified within 24 hours.

b. A Safety Limit Violation Report shall be prepared. The report shall be reviewed by the Operating Superintendent and Station Manager. This report shall describe: (1) applicable circumstances preceding the violation, (2) effects of the violation upon facility components, systems, or structures, and (3) corrective action taken to prevent recurrence;

c. The Safety Limit Violation Report shall be submitted to the Commission, the NSRB and the Vice President-Nuclear Production within 14 days of the violation; and

d. Critical operation of the unit shall not be resumed until authorized by the Commission.

6.8 PROCEDURES AND PROGRAMS

6.8.1 Written procedures shall be established, implemented, and maintained covering the activities referenced below:

a. The applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978;

b. The emergency operating procedures required to implement the requirements of NUREG-0737 and Supplement No. 1 to NUREG-0737 as stated in Generic Letter No. 82-33;

c. Security Plan implementation;*

d. Emergency Plan implementation;

e. PROCESS CONTROL PROGRAM implementation;

f. OFFSITE DOSE CALCULATION MANUAL implementation; and

g. Quality Assurance Program implementation for effluent and environmental monitoring.

6.8.2 Each procedure of Specification 6.8.1, and changes thereto, shall be reviewed and approved by the Station Manager; or by: (1) Operating Superintendent, (2) Technical Services Superintendent, ~~or~~ (3) Maintenance Superintendent, as previously designated by the Station Manager; prior to implementation and shall be reviewed periodically as set forth in administrative procedures. or (4) Superintendent of Integrated Scheduling,

6.8.3 Temporary changes to procedures of Specification 6.8.1 may be made provided:

a. The intent of the original procedure is not altered;

b. The change is approved by two members of the plant management staff, at least one of whom holds a Senior Operator license on the unit affected; and

c. The change is documented, reviewed, and approved by the Station Manager; or by: (1) Operating Superintendent, (2) Technical Services Superintendent, ~~or~~ (3) Maintenance Superintendent, as previously designated by the Station Manager; within 14 days of implementation. or (4) Superintendent of Integrated Scheduling,

6.8.4 The following programs shall be established, implemented, and maintained:

a. Primary Coolant Sources Outside Containment

A program to reduce leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to as low as practical levels. The systems include the containment spray, Safety Injection, chemical and volume control, and nuclear sampling. The program shall include the following:

* Review and approval may be performed by the Superintendent of Station Services.

RECORD RETENTION (Continued)

b. Records and logs of principal maintenance activities, inspections, repair, and replacement of principal items of equipment related to nuclear safety;

c. All REPORTABLE EVENTS;

d. Records of surveillance activities, inspections, and calibrations required by these Technical Specifications;

e. Records of changes made to the procedures required by Specification 6.8.1;

f. Records of radioactive shipments;

g. Records of sealed source and fission detector leak tests and results; and

h. Records of annual physical inventory of all sealed source material of record.

6.10.2 The following records shall be retained for the duration of the unit Operating License:

a. Records and drawing changes reflecting unit design modifications made to systems and equipment described in the Final Safety Analysis Report;

b. Records of new and irradiated fuel inventory, fuel transfers, and assembly burnup histories;

c. Records of radiation exposure for all individuals entering radiation control areas;

d. Records of gaseous and liquid radioactive material released to the environs;

e. Records of transient or operational cycles for those unit components identified in Table 5.7-1;

f. Records of reactor tests and experiments;

g. Records of training and qualification for current members of the unit staff;

h. Records of inservice inspections performed pursuant to these Technical Specifications;

~~i. Records of quality assurance activities required by the Operational Quality Assurance Manual;~~

j. Records of reviews performed for changes made to procedures or equipment or reviews of tests and experiments pursuant to 10 CFR 50.59;

k. Records of meetings of the NSRB and reports required by Specification 6.5.1.10;

l. Records of the service lives of all hydraulic and mechanical snubbers required by Specification 3.7.8 including the date at which the service life commences and associated installation and maintenance records;

∴ 6.10.3 Records of quality assurance activities required by the Operational Quality Assurance Manual shall be retained for a period of time as recommended by ANSI N45.2.9-1974.

RECORD RETENTION (Continued)

l. ~~k.~~ Records of secondary water sampling and water quality; and

m. ~~l.~~ Records of analyses required by the Radiological Environmental Monitoring Program that would permit evaluation of the accuracy of the analysis at a later date. This should include procedures effective at specified times and QA records showing that these procedures were followed.

6.11 RADIATION PROTECTION PROGRAM

6.11 Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

6.12 HIGH RADIATION AREA

6.12.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.203(c)(2) of 10 CFR Part 20, each high radiation area, as defined in 10 CFR Part 20, in which the intensity of radiation is equal to or less than 1000 mR/h at 45 cm (18 in.) from the radiation source or from any surface which the radiation penetrates shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures (e.g., Health Physics Technician) or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates equal to or less than 1000 mR/h, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area; or

b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them; or

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the Station Health Physicist in the RWP.

Attachment 3

Proposed Amendment to Catawba Unit 1
Technical Specification 4.8.2.1.1a Concerning
Electrolyte Leakage

JUSTIFICATION AND ANALYSIS OF SIGNIFICANT HAZARDS CONSIDERATION

The proposed change would remove an overly conservative restriction on a parameter which already has Technical Specification controls upon it. Surveillance Requirement 4.8.2.1.1a.1) requires that the parameters on Table 4.8-3, Category A, be met every 7 days. Electrolyte level is one of these parameters. The limits on these parameters ensure that the electrolyte level is sufficient for battery operability. The current Surveillance Requirement 4.8.2.1.1a.3) is a requirement not contained in the Standard Technical Specifications and is in conflict with Table 4.8-3. Given the parameters of Table 4.8-3, some electrolyte leakage could be allowed as long as the minimum electrolyte level is maintained. A small amount of visible electrolyte leakage does not lead one to the conclusion that the battery is inoperable and/or incapable of carrying out its intended safety function. The parameters of Table 4.8-3 in conjunction with the remainder of the other Surveillance Requirements sans 4.8.2.1.1a.3) are adequate to ensure the safe and reliable operation of the 125-volt battery banks and chargers.

10 CFR 50.92 states that a proposed amendment involves no significant hazards considerations if operation in accordance with the proposed amendment would not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3) Involve a significant reduction in a margin of safety.

The proposed amendment does not increase the probability or consequences of an accident previously evaluated and it does not create the possibility of a new or different kind of accident in that it does not directly affect the operation of the unit.

The proposed amendment does not involve a significant reduction in a margin of safety since the electrolyte level required to maintain the batteries in an operable status is already specified in Table 4.8-3. Therefore, Duke Power Company concludes that the proposed amendment does not involve significant hazards considerations.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

10 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. With two 125 VDC batteries and/or their full-capacity chargers inoperable and 125 VDC Batteries 1EBA and 1EBC and/or their full-capacity chargers in service, or 125 VDC Batteries 1EBB and 1EBD and/or their full-capacity chargers in service during this period of time, restore at least one battery and/or its full-capacity charger to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.2.1.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1) The parameters in Table 4.8-3 meet the Category A limits,

2) The total battery terminal voltage is greater than or equal to 125 volts on float charge, and

~~3) There is no visible indication of electrolyte leakage.~~

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1) The parameters in Table 4.8-3 meet the Category B limits,

2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohm, and

3) The average electrolyte temperature of six connected cells is above 60°F.

c. At least once per 18 months by verifying that:

1) The cells, cell plates (if visible), and battery racks show no visual indication of physical damage or abnormal deterioration,

2) The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,

3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohm, and

Attachment 4

Proposed Amendment to Catawba Unit 1
Technical Specification Figure 3.2-3 Concerning
Reactor Coolant System Total Flow Rate

JUSTIFICATION AND ANALYSIS OF SIGNIFICANT HAZARDS CONSIDERATION

The proposed changes to Figure 3.2-3 - "Reactor Coolant System Total Flow Rate Versus R - Four Loops In Operation" would delete the DNB Limit Line and add a graduated scale to allow a tradeoff of RCS flow against reactor power level.

The DNBR limit line is being deleted to clarify the figure and prevent operator misinterpretation since the rod bow factor (R_2) is not associated with this Technical Specification and thus the DNBR limit line serves no useful purpose. The graduated scale is being added to the Catawba curve as it was added for the McGuire Nuclear Station Technical Specifications (February 4, 1984 letter from Ms. E. G. Adensam to Mr. H. B. Tucker, transmitting Amendment 28 to License NPF-9 and Amendment 9 to License NPF-17) in order to allow operation with a measured reactor coolant flow less than 396,100 gpm if power level is reduced to adequately compensate for the flow deficiency.

The power/flow ratio used in the tradeoff is greater than 2% RTP per 1% reactor coolant flow below 396,100 gpm. The 2% RTP/1% flow tradeoff is based upon Westinghouse sensitivity studies with additional penalties added for conservatism. The 2/1 ratio was used for the McGuire Nuclear Station Technical Specifications and has been reviewed and approved by the NRC.

10 CFR 50.92 states that a proposed amendment involves no significant hazards considerations if operation in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

The proposed amendment does not involve an increase in the probability or consequences of any previously evaluated accident. The accident analyses will be unaffected by this change.

The proposed amendment does not create the possibility of a new or different kind of accident than any previously evaluated since the plant will be operating at flows and power levels taken into account in the accident analyses.

The proposed amendment has previously been reviewed and approved by the NRC Staff for McGuire, thus there will be no significant (unacceptable) reduction in any margin of safety.

For the reasons stated above, it is concluded that the proposed amendment does not involve significant hazards considerations.

PENALTIES OF 0.1% FOR UNDETECTED FEEDWATER VENTURI FOULING AND MEASUREMENT UNCERTAINTIES OF 2.1% FOR FLOW AND 4.0% FOR INCORE MEASUREMENT OF $F^N_{\Delta H}$ ARE INCLUDED IN THIS FIGURE.

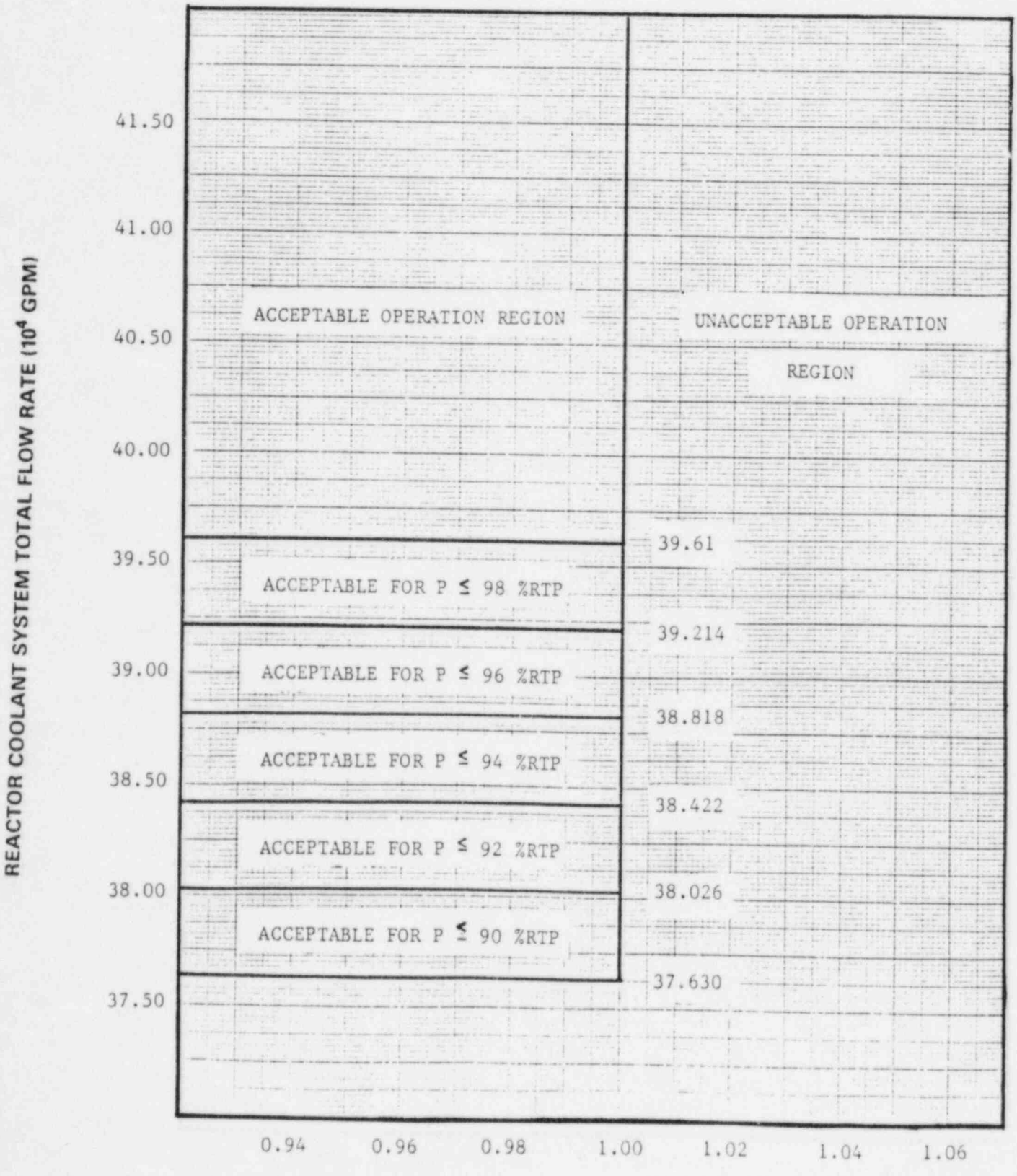

FIGURE 3.2-3

REACTOR COOLANT SYSTEM TOTAL FLOW RATE VERSUS R - FOUR LOOPS IN OPERATION