NLS960038
March 5, 1996

Attachment 1 - Marked-up pages showing revisions made by this letter to previously proposed changes.

Pages: 128, 131, 200

3.5 BASES (cont'd)

is available at all times. It is during refueling outages that major maintenance is performed and during such time that all low pressure core cooling systems may be out of service. Specification 3.5.F.4 provides that should this occur, no work will be performed on the primary system which could lead to draining the vessel. This work would include work on certain control rod drive components and recirculation system. Thus, the specification precludes the events which could require core cooling. Specification 3.5.F.5 recognizes that, concurrent with control rod drive maintenance during the refueling outage, it may be necessary to drain the suppression chamber for maintenance or for the inspection required by Specification 4.7.A.2.h. In this case, if excessive control rod housing leakage occurred, three levels of protection against loss of core cooling would exist. First, a special flange would be used to stop the leak. Second, sufficient inventory of water is maintained to provide, under worst case leak conditions, approximately 60 minutes of core cooling while attempts to secure the leak are made. This inventory includes water in the reactor well, spent fuel pool, and condensate storage tank. If a leak should occur, manually operated valves in the condensate transfer system can be opened to supply either the Core Spray System or the spent fuel pool. Third, sufficient inventory of water is maintained to permit the water which has drained from the vessel to fill the torus to a level above the Core Spray and LPCI suction strainers. These systems could then recycle the water to the vessel. Since the system cannot be pressurized during refueling, the potential need for core flooding only exists and the specified combination of the Core Spray or the LPCI subsystems can provide this.

The remaining requirements of 3.9.A.1 ensures that highly reliable and diverse power sources remain with one diesel generator inoperable. It is necessary to verify that the required off-site sources are available and capable of supplying power to the emergency buses, and that loss of voltage and undervoltage relay circuits associated with the emergency buses are operable.

For a detailed explanation of the 4.5.F.1 requirements see the BASES Section 4.5 on page 131 of these Technical Specifications.

This specification also provides for the highly unlikely case that both diesel generators are found to be inoperable. With two Diesel Generators (DGs) inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, there are no standby AC sources available to power the minimum required ESF functions. Since offsite electrical power is the only source of AC power for the majority of ESF equipment at this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown. ~~Immediate shutdown could cause grid instability, which could result in a total loss of AC power.~~ Since any inadvertent unit generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Regulatory 1.93, with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

If the Diesel Generators cannot be restored to OPERABLE status within the 2 hour completion time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be in the HOT STANDBY CONDITION within 12 hours, and in the COLD CONDITION within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. This will be accomplished while the two off-site sources of power required by Specification 3.9.A.1 are available.

G. Maintenance of Filled Discharge Pipe

If the discharge piping of the Core Spray, LPCI, HPCI, and RCIC systems are not filled, a water hammer can develop in this piping when the pump and/or pumps are started. If a water hammer were to occur at the time at which the system were required, the system would still perform its design functions. However, to minimize damage to the discharge piping and to ensure added margin in the operation of these systems, this Technical Specification requires the discharge lines to be filled whenever the system is in an operable condition.

4.5 BASES

Core and Containment Cooling Systems Surveillance Frequencies

The testing intervals for the core and containment cooling systems are based on industry practice, quantitative reliability analysis, judgement and practicality. The core cooling systems have not been designed to be fully testable during operation. For example, in the case of the HPCI System, automatic initiation during power operation would result in pumping cold water into the reactor vessel, which is not desirable. Complete ADS testing during power operation causes an undesirable loss-of-coolant inventory. To increase the availability of the core and containment cooling systems, the components which make up the system; i.e., instrumentation, pumps, valves, etc., are tested frequently. The pumps and motor operated injection valves are also tested each month to assure their operability. A simulated automatic actuation test once each cycle combined with frequent tests of the pumps and injection valves is deemed to be adequate testing of these systems.

When components and subsystems are out-of-service, overall core and containment cooling reliability is maintained by verifying the operability of the remaining equipment. For routine out-of-service periods caused by preventative maintenance, etc., the operability of other systems and components will be verified as given in the Technical Specifications. However, if a failure or design deficiency caused by outage, then a demonstration of operability may be needed to assure that a generic problem does not exist. For example, if an out-of-service period were caused by failure of a pump to deliver rated capacity due to a design deficiency, the other pumps of this type might be subjected to a flow rate test.

Verification of operability consists of verifying that the surveillance is current, and that other available information does not indicate inoperability.

The requirements of 4.5.F.1, assure that adequate core cooling equipment associated with the OPERABLE diesel generator is available. This requirement provides confidence that diesel generator inoperabilities are investigated for common cause failures, regardless of how long the diesel generator inoperability exists.

The requirements of 4.5.F.1, provides an allowance to avoid unnecessary testing of OPERABLE diesel generators. If it can be determined that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generator, then surveillance requirement 4.9.A.2.a.1, does not have to be performed. If the cause of inoperability exists on the other diesel generator, they are both declared inoperable and LCO 3.5.F.2 is entered. Once the failure is repaired, a common cause failure no longer exists, the required action of 3.5.F.2 is satisfied. If the cause of the initial inoperable diesel generator cannot be confirmed not to exist on the OPERABLE diesel generator, performance of surveillance requirement 4.9.A.2.a.1 suffices to provide assurance of continued OPERABILITY of that diesel generator.

The completion time of 24 hours for common cause is intended to allow the operator time to evaluate any common cause failures. ~~According to Generic Letter 84-15, 24 hours is a reasonable time to confirm that the OPERABLE diesel generator is not affected by the same problem as the inoperable diesel generator.~~

The LCO completion times of 7 days for one inoperable diesel generator, 72 hours for demonstrating the redundant diesel generator, and 24 hours for two inoperable diesel generators, begins on the discovery (declaration) that an inoperable diesel generator(s) exists. This information is provided to ensure that consistency among operators is utilized concerning the entrance and completion of surveillance requirement 4.5.F.1.

Demonstration of the diesel generator to be OPERABLE can be achieved by the performance of Surveillance Requirement 4.9.A.2.a.1 or 4.9.A.2.a.2.

3.9 BASES (cont'd)

The condition defined in Specification 3.9.B.2.e is entered as a result of failure to meet the acceptance criteria for new diesel fuel properties. A period of 30 days is allowed for restoring the stored diesel fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or a combination of these procedures. Even if a DG start and load was required during this time interval and the fuel properties were outside the limits, there is high likelihood that the DG would still be capable of performing its intended function.

The D. C. Power Systems allowable out-of-service time is based on NRC Regulatory Guide 1.93, "Availability of Electrical Power Sources." The two-hour limit to restore battery operability minimizes reactor operation while in a degraded condition.

4.9 BASES

The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 50% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for at least two hours. Diesel generator experience at other generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required.

Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2 help to ensure the availability of the standby electrical power supply to mitigate Design Basis Accidents and transients and maintain the unit in a safe shutdown condition. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 50% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for at least two hours.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2 allows for a engine prelube period. In addition, 4.9.A.2.a.1 allows a warmup period prior to loading as an additional measure to minimize wear.

For the purposes of this testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce the stress and wear on the diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. This is the intent of 4.9.A.2.a.1.

~~Surveillance Requirement 4.9.A.2.a.2 requires that, at a six month frequency, the DG starts from standby conditions and the starting time to reach rated voltage and frequency shall be logged. The timed starting requirement supports the assumptions in the design basis LOCA analysis of UCAR, Volume IV, Section VIII, Subsection 5.0, "Standby A.C Power Source." The starting time requirement is not applicable to 4.9.A.2.a.1 when a modified start procedure is used. If a modified start is not used, the starting requirements of 4.9.A.2.a.2 applies.~~

~~Since 4.9.A.2.a.2 has the starting time requirement, it is more restrictive than 4.9.A.2.a.1 and may be performed in lieu of 4.9.A.2.a.1.~~

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Attachment 2 - Compilation of proposed changes (as originally submitted in Reference 1 and subsequently revised by Reference 2 and again by this letter).

Pages: 120, 121, 128, 131, 192, 193, 193a, 199, 200, 201, 202

LIMITING CONDITIONS FOR OPERATION

3.5.E (cont'd)

2. From and after the date that one valve in the Automatic Depressurization System is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding seven days unless such valve is sooner made operable, provided that during such seven days the HPCI System is operable.

3. With the surveillance requirements of 4.6.D.5 not performed at the required intervals due to reactor shutdown, a reactor startup may be conducted provided the appropriate surveillance is performed within 12 hours of achieving 113 psig reactor steam pressure.

4. If the requirements of 3.5.E.1 or 3.5.E.2 cannot be met, an orderly shutdown shall be initiated and the reactor pressure shall be reduced to at least 113 psig within 24 hours.

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. During any period when one diesel generator is inoperable, continued reactor operation is permissible only during the succeeding seven days unless such diesel generator is sooner made operable, provided that the operable diesel generator and its associated LPCI, Core Spray, and RHR Service Water subsystems are operable, the requirements of 4.5.F.1 and the remaining requirements of 3.9.A.1 are met. If these requirements cannot be met, the requirements of 3.5.F.2 shall be met.

SURVEILLANCE REQUIREMENTS

4.5.E (cont'd)

2. When it is determined that one valve of the ADS is inoperable, the ADS actuation logic for the other ADS valves shall be demonstrated to be operable immediately. In addition, the HPCI System shall be verified to be operable immediately.

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. When it is determined that one diesel generator is inoperable, the following requirements shall be met.

   a. Immediately and daily thereafter, the redundant diesel generator shall be verified to be OPERABLE.

   b. Immediately and daily thereafter, the LPCI, Core Spray, and RHR Service Water subsystems associated with the OPERABLE diesel generator shall be verified to be operable.

   c. Within 24 hours determine OPERABLE diesel generator is not inoperable due to common cause failure, or perform Surveillance 4.9.A.2.a.1.

   d. Within 72 hours and every 72 hours thereafter, the OPERABLE diesel generator shall be demonstrated to be OPERABLE if the inoperable diesel generator is not sooner declared OPERABLE.

LIMITING CONDITIONS FOR OPERATION

3.5.F (cont'd.)

2. During any period when both diesel generators are inoperable, continued reactor operation is permissible only during the succeeding 2 hours unless one diesel generator is sooner made operable, provided that both LPCI subsystems, both Core Spray subsystems, and both RHR Service Water subsystems are operable and the remaining requirements of 3.9.A.1 are met. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor placed in the hot standby condition within 12 hours, and in the cold shutdown condition within 36 hours.

3. Any combination of inoperable components in the LPCI, RHR Service Water, and Core Spray systems shall not defeat the capability of the remaining operable components to fulfill the cooling functions.

4. When irradiated fuel is in the reactor vessel and the reactor is in the Cold Shutdown Condition, both Core Spray subsystems, both LPCI subsystems, and both RHR Service Water subsystems may be inoperable, provided no work is being done which has the potential for draining the reactor vessel. Refueling requirements are as specified in Specification 3.10.F.

5. With irradiated fuel in the reactor vessel, one control rod drive housing may be open while the suppression chamber is completely drained provided that:

   a. The reactor vessel head is removed.

   b. The spent fuel pool gates are open and the fuel pool water level is maintained at a level ≥ 33 feet.

   c. The condensate transfer system is operable and a minimum of 230,000 gallons of water is in the condensate storage tank.

SURVEILLANCE REQUIREMENTS

4.5.F (cont'd.)

3.5 BASES (cont'd)

is available at all times. It is during refueling outages that major maintenance is performed and during such time that all low pressure core cooling systems may be out of service. Specification 3.5.F.4 provides that should this occur, no work will be performed on the primary system which could lead to draining the vessel. This work would include work on certain control rod drive components and recirculation system. Thus, the specification precludes the events which could require core cooling. Specification 3.5.F.5 recognizes that, concurrent with control rod drive maintenance during the refueling outage, it may be necessary to drain the suppression chamber for maintenance or for the inspection required by Specification 4.7.A.2.h. In this case, if excessive control rod housing leakage occurred, three levels of protection against loss of core cooling would exist. First, a special flange would be used to stop the leak. Second, sufficient inventory of water is maintained to provide, under worst case leak conditions, approximately 60 minutes of core cooling while attempts to secure the leak are made. This inventory includes water in the reactor well, spent fuel pool, and condensate storage tank. If a leak should occur, manually operated valves in the condensate transfer system can be opened to supply either the Core Spray System or the spent fuel pool. Third, sufficient inventory of water is maintained to permit the water which has drained from the vessel to fill the torus to a level above the Core Spray and LPCI suction strainers. These systems could then recycle the water to the vessel. Since the system cannot be pressurized during refueling, the potential need for core flooding only exists and the specified combination of the Core Spray or the LPCI subsystems can provide this.

The remaining requirements of 3.9.A.1 ensures that highly reliable and diverse power sources remain with one diesel generator inoperable. It is necessary to verify that the required off-site sources are available and capable of supplying power to the emergency buses, and that loss of voltage and undervoltage relay circuits associated with the emergency buses are operable.

For a detailed explanation of the 4.5.F.1 requirements see the BASES Section 4.5 on page 131 of these Technical Specifications.

This specification also provides for the highly unlikely case that both diesel generators are found to be inoperable. With two Diesel Generators (DGs) inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, there are no standby AC sources available to power the minimum required ESF functions. Since offsite electrical power is the only source of AC power for the majority of ESF equipment at this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown. Since any inadvertent unit generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Regulatory 1.93, with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

If the Diesel Generators cannot be restored to OPERABLE status within the 2 hour completion time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be in the HOT STANDBY CONDITION within 12 hours, and in the COLD CONDITION within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. This will be accomplished while the two off-site sources of power required by Specification 3.9.A.1 are available.

G. Maintenance of Filled Discharge Pipe

If the discharge piping of the Core Spray, LPCI, HPCI, and RCIC systems are not filled, a water hammer can develop in this piping when the pump and/or pumps are started. If a water hammer were to occur at the time at which the system were required, the system would still perform its design functions. However, to minimize damage to the discharge piping and to ensure added margin in the operation of these systems, this Technical Specification requires the discharge lines to be filled whenever the system is in an operable condition.

4.5 BASES

Core and Containment Cooling Systems Surveillance Frequencies

The testing intervals for the core and containment cooling systems are based on industry practice, quantitative reliability analysis, judgement and practicality. The core cooling systems have not been designed to be fully testable during operation. For example, in the case of the HPCI System, automatic initiation during power operation would result in pumping cold water into the reactor vessel, which is not desirable. Complete ADS testing during power operation causes an undesirable loss-of-coolant inventory. To increase the availability of the core and containment cooling systems, the components which make up the system; i.e., instrumentation, pumps, valves, etc., are tested frequently. The pumps and motor operated injection valves are also tested each month to assure their operability. A simulated automatic actuation test once each cycle combined with frequent tests of the pumps and injection valves is deemed to be adequate testing of these systems.

When components and subsystems are out-of-service, overall core and containment cooling reliability is maintained by verifying the operability of the remaining equipment. For routine out-of-service periods caused by preventative maintenance, etc., the operability of other systems and components will be verified as given in the Technical Specifications. However, if a failure or design deficiency caused by outage, then a demonstration of operability may be needed to assure that a generic problem does not exist. For example, if an out-of-service period were caused by failure of a pump to deliver rated capacity due to a design deficiency, the other pumps of this type might be subjected to a flow rate test.

Verification of operability consists of verifying that the surveillance is current, and that other available information does not indicate inoperability.

The requirements of 4.5.F.1, assure that adequate core cooling equipment associated with the OPERABLE diesel generator is available. This requirement provides confidence that diesel generator inoperabilities are investigated for common cause failures, regardless of how long the diesel generator inoperability exists.

The requirements of 4.5.F.1, provides an allowance to avoid unnecessary testing of OPERABLE diesel generators. If it can be determined that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generator, then surveillance requirement 4.9.A.2.a.1, does not have to be performed. If the cause of inoperability exists on the other diesel generator, they are both declared inoperable and LCO 3.5.F.2 is entered. Once the failure is repaired, a common cause failure no longer exists, the required action of 3.5.F.2 is satisfied. If the cause of the initial inoperable diesel generator cannot be confirmed not to exist on the OPERABLE diesel generator, performance of surveillance requirement 4.9.A.2.a.1 suffices to provide assurance of continued OPERABILITY of that diesel generator.

The completion time of 24 hours for common cause is intended to allow the operator time to evaluate any common cause failures.

The LCO completion times of 7 days for one inoperable diesel generator, 72 hours for demonstrating the redundant diesel generator, and 2 hours for two inoperable diesel generators, begins on the discovery (declaration) that an inoperable diesel generator(s) exists. This information is provided to ensure that consistency among operators is utilized concerning the entrance and completion of surveillance requirement 4.5.F.1.

Demonstration of the diesel generator to be OPERABLE can be achieved by the performance of Surveillance Requirement 4.9.A.2.a.1 or 4.9.A.2.a.2.

LIMITING CONDITIONS FOR OPERATION

3.9.B

B. Operation with Inoperable Equipment

Whenever the reactor is in Run Mode or Startup Mode with the reactor not in a Cold Condition, the availability of electric power shall be as specified in 3.9.A.1, except as specified in 3.9.B.1.

1. Incoming Power

a. From and after the date incoming power is not available from a startup or emergency transformer, continued reactor operation is permissible under this condition for seven days. During this period, the two diesel generators and associated critical buses must be verified to be operable.

b. From and after the date that incoming power is not available from both start-up and emergency transformers (i.e., both failed), continued operation is permissible, only during the succeeding 24 hours unless one power source is sooner made operable, provided the two diesel generators and associated critical buses are verified to be operable, and all core and containment cooling systems are operable. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor placed in the cold shutdown condition within 24 hours.

SURVEILLANCE REQUIREMENTS

4.9.A (cont'd.)

LIMITING CONDITIONS FOR OPERATION

3.9.B (cont'd.)

2. Diesel Generators

a. From and after the date that one of the diesel generators or an associated critical bus is made or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specification 3.5.F.1 if the remaining requirements of Specification 3.9.A.1 are satisfied.

b. From and after the date that both diesel generators are made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 2 hours in accordance with Specification 3.5.F.2 if the remaining requirements of Specification 3.9.A.1 are satisfied.

c. From and after the date that one of the diesel generators or associated critical buses and either the emergency or startup transformer power source are made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 24 hours unless such diesel generator or power source is sooner made operable, provided the other off-site source, startup transformer or emergency transformer is available and capable of automatically supplying power to the 4160V critical buses.

d. From and after the date that the diesel fuel oil particulate concentration level defined in Surveillance Requirement 4.9.A.2.d cannot be met, restore the diesel fuel oil total particulate concentration to within the acceptable limits within 7 days, or declare the associated Diesel Generator inoperable.

e. From and after the date that the new diesel fuel oil properties defined in Surveillance Requirement 4.9.A.2.e.2 cannot be met, restore the stored diesel fuel oil properties to within acceptable limits within 30 days, or declare the associated Diesel Generator inoperable.

SURVEILLANCE REQUIREMENTS

4.9.A (cont'd)

2. Diesel Generators

a. 1. Each diesel generator shall be started manually and loaded to not less than 50% of rated load for no less than 2 hours once each month to demonstrate operational readiness. A modified DG start involving idling and gradual acceleration to synchronous speed may be used as recommended by the manufacturer. This Surveillance Requirement may be preceded with an engine prelube period prior to starting and followed by a warmup period prior to loading.

When modified start procedures are not used, the time, voltage, and frequency requirements of 4.9.A.2.a.2 must be met. The performance of Surveillance Requirement 4.9.A.2.a.2 satisfies this Surveillance Requirement.

During this monthly generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the fuel oil transfer pumps and fuel oil day tank level switches shall be demonstrated.

2. Each diesel generator shall be started manually and loaded to not less than 50% of rated load for no less than 2 hours every six months to demonstrate operational readiness.

During this generator test the diesel generator starting air compressor shall be checked for operation and its ability to recharge air receivers. The operation of the fuel oil transfer pumps and fuel oil day tank level switches shall be demonstrated and the diesel starting time to reach rated voltage and frequency shall be logged. This Surveillance Requirement may be preceded by an engine prelube period prior to starting. The performance of this Surveillance Requirement satisfies the requirements of 4.9.A.2.a.1.

LIMITING CONDITIONS FOR OPERATION

3.9.B (cont'd.)

SURVEILLANCE REQUIREMENTS

4.9.A.2 (cont'd)

b. Once every 18 months the condition under which the diesel generator is required will be simulated and a test conducted to demonstrate that it will start and accept the emergency load within the specified time sequence. The results shall be logged.

c. Once a month the quantity of diesel fuel available shall be logged.

d. At least once per month the particulate concentration level of the Diesel Fuel Oil Storage Tanks shall be determined in accordance with ASTM D2276-1989, Method A. The total particulate concentration in the diesel fuel oil storage tanks, shall have a limit of less than 10 mg/liter when checked in accordance with ASTM-D2276-1989, Method A.

e. New fuel oil sampling will be performed in accordance with ASTM-D4057-1988 within 30 days upon delivery. Fuel oil testing will be performed in accordance with the following:

1. By verifying in accordance with the tests specified in ASTM-D975-1989a 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

3.9 BASES

The general objective of this Specification is to assure an adequate source of electrical power to operate the auxiliaries during plant operation, to operate facilities to cool and lubricate the plant during shutdown and to operate the engineered safeguards following the accident. There are three sources of ac electrical energy available; namely, the startup transformer, the emergency transformer and two diesel generators. The dc supply is required for switch gear and engineered safety feature systems. This supply consists of two 125V DC and two 250V DC batteries and their related chargers. Specification 3.9.A states the required availability of ac and dc power; i.e., active off-site ac sources and the required amount of on-site ac and dc sources.

Auxiliary power for CNS is supplied from the startup transformer and the normal transformer. Both of these transformers are sized to carry 100% of the station auxiliary load. The emergency transformer is about one third the size of these two transformers and is equal in size to both emergency diesel generators.

The startup transformer and the emergency transformers are the offsite power sources. Their voltage is monitored by undervoltage relays which provide low voltage protection for the emergency buses. Whenever the voltage setpoint and time delay limit for the undervoltage relays have been exceeded, the emergency buses are automatically disconnected from the offsite power source.

If the startup or emergency transformer is lost, the unit can continue to operate since the unit auxiliary transformer is in service, and the emergency or startup transformer and the diesels are available.

If both the startup and emergency transformers become inoperable, the power level must be reduced to a value where by the unit can safely reject the load and continue to supply auxiliary electric power to the station.

In the normal mode of operation, the startup and emergency transformers are energized and two diesel generators are operable. One diesel generator may be allowed out of service based on the availability of power from the startup transformer and the fact that one diesel generator carries sufficient engineered safeguards equipment to cover all line breaks. With the startup transformer and one diesel generator out of service, the off site transmission line corresponding to the emergency transformer must be available. Upon the loss of one on-site and one off-site power source, power would be available from the other immediate off-site power source and the two operable on-site diesels to carry sufficient engineered safeguards equipment to cover all breaks. In addition to these two power sources, removal of the Isolated Phase Bus "quick" disconnect links would allow backfeed of power through the main transformer to the unit auxiliary transformer and provide power to carry the full station auxiliary load. The time required to perform this operation is comparable to the time the reactor could remain on RCIC operation before controlled depressurization need be initiated.

The condition defined in Specification 3.9.B.2.d is entered as a result of failure to meet the acceptance criterion for particulates. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sampling procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulate does not mean failure of the fuel to burn properly in the diesel engine, the particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 1 month), it is prudent to allow a seven day period for corrective action prior to declaring the associated DG inoperable. The 7 day completion time allows for further evaluation, resampling, and re-analysis of the DG fuel oil.

3.9 BASES (cont'd)

The condition defined in Specification 3.9.B.2.e is entered as a result of failure to meet the acceptance criteria for new diesel fuel properties. A period of 30 days is allowed for restoring the stored diesel fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or a combination of these procedures. Even if a DG start and load was required during this time interval and the fuel properties were outside the limits, there is high likelihood that the DG would still be capable of performing its intended function.

The D. C. Power Systems allowable out-of-service time is based on NRC Regulatory Guide 1.93, "Availability of Electrical Power Sources." The two-hour limit to restore battery operability minimizes reactor operation while in a degraded condition.

4.9 BASES

The monthly test of the diesel generator is conducted to check for equipment failures and deterioration. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 50% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for at least two hours. Diesel generator experience at other generating stations indicates that the testing frequency is adequate and provides a high reliability of operation should the system be required.

Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2 help to ensure the availability of the standby electrical power supply to mitigate Design Basis Accidents and transients and maintain the unit in a safe shutdown condition. Testing is conducted up to equilibrium operating conditions to demonstrate proper operation at these conditions. The diesel generator will be manually started, synchronized and connected to the bus and load picked up. The diesel generator should be loaded to at least 50% of rated load to prevent fouling of the engine. It is expected that the diesel generator will be run for at least two hours.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, Surveillance Requirements 4.9.A.2.a.1 and 4.9.A.2.a.2 allows for a engine prelube period. In addition, 4.9.A.2.a.1 allows a warmup period prior to loading as an additional measure to minimize wear.

For the purposes of this testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce the stress and wear on the diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. This is the intent of 4.9.A.2.a.1.

4.9 BASES (cont'd)

Each diesel generator has two air compressors and two air receivers for starting. It is expected that the air compressors will run only infrequently. During the monthly check of the diesel generator, each receiver in each set of receivers will be drawn down below the point at which the corresponding compressor automatically starts to check operation and the ability of the compressors to recharge the receivers.

Diesel fuel oil degradation during long term storage shows up as an increase in particulate, mostly due to oxidation. The presence of particulate does not mean that the diesel fuel oil will not burn properly in the diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure. Particulate concentrations shall be determined in accordance with ASTM-D2276-1989, Method A. The frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between frequency intervals.

The tests for diesel fuel oil properties defined in Surveillance Requirement (SR) 4.9.A.2.e.1 are a means of determining whether new diesel fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate detrimental impact on diesel engine combustion. If results from the test defined in SR 4.9.A.2.e.1 are within acceptable limits, the diesel fuel oil may be added to the storage tanks without concern for contaminating the entire volume of diesel fuel oil in the storage tanks. These tests are to be conducted prior to adding the new diesel fuel oil to the storage tanks, but in no case is the time between receipt of new diesel fuel oil and conducting the tests to exceed one month.

Within one month following the initial new diesel fuel oil sample (SR 4.9.A.2.e.1), the new diesel fuel oil is analyzed to establish that the remaining fuel oil properties defined in SR 4.9.A.2.e.2 are met when tested in accordance with ASTM-D975-1989a. The one month period is acceptable because the diesel fuel oil properties of interest (SR 4.9.A.2.e.2), even if they were not within stated limits, would not have an immediate effect on Diesel Generator operation. This surveillance ensures the continued availability of high quality diesel fuel oil for the Diesel Generators.

Microbiological fouling is a major cause of diesel fuel oil degradation. There are numerous bacteria that can grow in diesel fuel oil storage tanks and cause fouling, but all must have a water environment in order to survive. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the water tight integrity of the fuel oil system. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. This surveillance requirement is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed. If the presence of water is detected by Surveillance Requirement 4.9.A.2.f, the removal of water to the extent practical from the diesel fuel oil day tanks must be accomplished within two days of the discovery of the water. If the presence of water detected by Surveillance Requirement 4.9.A.2.g is greater than a nominal value of four inches from the bottom of the diesel fuel oil storage tanks, then a maximum of seven days is allowed for removal of the water. The nominal four inch value is a function of the water that can be practically removed from the diesel fuel oil storage tanks.

The diesel generator fuel consumption rate at full load is approximately 275 gallons per hour. Thus, the monthly load test of the diesel generators will test the operation and the ability of the fuel oil transfer pumps to refill the day tank and will check the operation of these pumps from the emergency source.

The test of the diesel generator during the refueling outage will be more comprehensive in that it will functionally test the system; i.e, it will check diesel generator starting and closure of diesel generator breaker and sequencing of load on the diesel generator. The diesel generator will be started by simulation of a loss-of-coolant accident. In addition, an undervoltage condition will be imposed to simulate a loss of off-site power.

4.9 BASES (cont'd)

Periodic tests between refueling outages verify the ability of the diesel generator to run at full load and the core and containment cooling pumps to deliver full flow. Periodic testing of the various components, plus a functional test once-a-cycle, is sufficient to maintain adequate reliability.

When it is determined that some auxiliary electrical equipment is out of service, the increased surveillance required in Section 4.5.F is deemed adequate to provide assurance that the remaining equipment will be operable.

The surveillance requirements for demonstrating the OPERABILITY of the unit batteries are in accordance with the recommendations of NRC Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants, dated February 1978 and IEEE Std 450-1987, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Once each operating cycle, during shutdown, either a service test or performance discharge is performed on the 125 V and the 250 V batteries. The performance discharge test is performed in lieu of the service test when a battery shows signs of degradation. Degradation is indicated when 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.

Replacement criteria for 125V and 250V station batteries is ≤80% capacity factor and the maximum time for replacement should be one (1) year. This will assure that the remaining battery capacity is adequate to meet load requirements.

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 of the battery to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Due to the physical configuration of the CNS batteries, two different inter-cell connection resistance values are surveilled. Each division of the 125V and 250V batteries are configured into two racks, coupled with inter-rack connectors. Therefore, separate resistance values are provided for both the inter-cell (copper-bar type) and inter-rack (cable-type) connectors to demonstrate acceptability of battery connection resistance.

Table 3.9.1 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 ensure that their float voltage and specific gravity are characteristic of a charged cell with adequate capacity, and ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 3.9.1 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 0.020 below the average specific gravity of all connected cells 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 2.10 volts, ensures the battery's capability to perform its design function.

The Reactor Protection System (RPS) is equipped with a seismically qualified, Class 1E power monitoring system. This system consists of eight Electrical Protection Assemblies (EPA) which isolate the power sources from the RPS if the input voltage and frequency are not within limits specified for safe system operation. Isolation of RPS power causes that RPS division to fail safe.

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The following table identifies those actions committed to by the District in this document. Any other actions discussed in the submittal represent intended or planned actions by the District. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITTED DATE OR OUTAGE
None.	