Omaha Public Power District

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July 25, 2003
LIC-03-0084

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Reference: Docket No. 50-285

SUBJECT: Fort Calhoun Station Unit No. 1 License Amendment Request, "Staggered Integrated Engineered Safety Features Testing"

Pursuant to 10 CFR 50.90, Omaha Public Power District (OPPD) hereby requests the following amendment to Fort Calhoun Station (FCS) Technical Specifications (TS) 3.0.2, Table 3-2, Table 3-5, 3.6, 3.7, 3.8, and the Definitions Section. This proposed change provides a risk informed alternative to the existing surveillance interval for the integrated Engineered Safety Features (ESF) and Loss of Offsite Power (LOOP) testing required to be performed on each ESF equipment train each outage. The proposed change modifies the surveillance interval requirement for these refueling interval Surveillance Requirements to go to a Staggered Test Basis scheme. Using a Staggered Test Basis, only one train would be tested each refueling outage. This amendment is modeled after the Improved Standard Technical Specifications (ISTS) and is based on a study conducted by the Westinghouse Electric Company, LLC on behalf of the Combustion Engineering Owners Group (CEOG) in topical report WCAP-15830-P, "Staggered Integrated ESF Testing," and Technical Specification Task Force (TSTF) 450.

Attachment 1 provides the No Significant Hazards Evaluation and the technical bases for this requested change to the TS. Attachment 2 contains a marked-up version reflecting the requested TS and Basis changes. Attachment 3 contains a clean version reflecting the proposed TS and Basis.

OPPD requests approval of the proposed amendment by March 1, 2004. OPPD requests 120 days to implement this amendment. No commitments are made to the NRC in this letter.

A001

I declare under penalty of perjury that the foregoing is true and correct. (Executed on July 18, 2003)

If you have any questions or require additional information, please contact Dr. R. L. Jaworski at (402) 533-6833.

Sincerely,

D. J. Bannister
Manager – Fort Calhoun Station

RTR/TRB/trb

Attachments:
1. Fort Calhoun Station's Evaluation
2. Markup of Technical Specification Pages
3. Proposed Technical Specification Pages

c: T. P. Gwynn, Acting NRC Regional Administrator, Region IV
A. B. Wang, NRC Project Manager
J. G. Kramer, NRC Senior Resident Inspector
Division Administrator - Public Health Assurance, State of Nebraska

ATTACHMENT 1

Fort Calhoun Station's Evaluation for Amendment of Operating License

1.0 INTRODUCTION

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Fort Calhoun Station's Evaluation for Amendment of Operating License

1.0 INTRODUCTION

This letter is a request to amend Operating License DPR-40 for Fort Calhoun Station (FCS) Unit No. 1.

The proposed change will revise FCS Technical Specification (TS) 3.0.2, Table 3-2, Table 3-5, 3.6, 3.7, 3.8, and the Definitions Section. This proposed change provides a risk informed alternative to the existing surveillance interval for the integrated Engineered Safety Features (ESF) and Loss of Offsite Power (LOOP) testing required to be performed on each ESF equipment train each outage. The proposed change modifies the surveillance interval requirement for these refueling interval Surveillance Requirements to go to a Staggered Test Basis scheme. Using a Staggered Test Basis, only one train would be tested each refueling outage. This amendment is modeled after the Improved Standard Technical Specifications (ISTS) and is based on a study conducted by the Westinghouse Electric Company, LLC on behalf of the Combustion Engineering Owners Group (CEOG) in topical report WCAP-15830-P, "Staggered Integrated ESF Testing," and Technical Specification Task Force (TSTF) 450.

2.0 DESCRIPTION OF PROPOSED AMENDMENT

The proposed changes to the TS Definitions Section will add a definition for "Staggered Test Basis" consistent with the guidance of Reference 10.1. The proposed changes for TS Section 3.0 will add a new surveillance interval of "Staggered Refueling" to TS Section 3.0.2. The proposed changes to TS Table 3-2 will perform the following:

- Table 3-2, Item 3b: Change the surveillance interval for the Safety Injection Actuation Logic Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 5b: Change the surveillance interval for the Containment Spray Actuation Logic Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 7a: Change the surveillance interval for the Manual Safety Injection Actuation Test from a Refueling interval to a Staggered Refueling interval. This item was intended to be included in the edition of WCAP-15830-P submitted to the NRC by the Westinghouse Owners Group for review on April 21, 2003; however this item was inadvertently omitted due to an editorial error. This editorial error will be corrected in a future revision to WCAP-15830-P.

- Table 3-2, Item 8a: Change the surveillance interval for the Manual Containment Isolation Actuation Check from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 8b: Change the surveillance interval for the Manual Containment Isolation Actuation Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 9a: Change the surveillance interval for the Manual Containment Spray Actuation Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 19a: Change the surveillance interval for the Manual Recirculation Actuation Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 20b: Change the surveillance interval for the Recirculation Actuation Logic Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

- Table 3-2, Item 22a: Change the surveillance interval for the Manual Emergency Off-site Power Low Trip Actuation Channel Functional Test from a Refueling interval to a Staggered Refueling interval.

The proposed changes to TS Table 3-5 will perform the following:

- Table 3-5, Item 10a.4: Change the surveillance interval for the automatic and manual initiation demonstration of the Control Room Charcoal and HEPA Filtration System from a Refueling interval to a Staggered Refueling interval.

- Table 3-5, Item 14, Change the surveillance interval for the Pressurizer Heaters control Circuits operation verification for post-accident use from a Refueling interval to a Staggered Refueling interval.

The proposed change to TS 3.6(1) changes the surveillance interval for the Safety Injection System test from a Refueling interval to a Staggered Refueling interval. The proposed change to TS 3.6(2) changes the surveillance interval for the Containment Spray System test from a Refueling interval to a Staggered Refueling interval. The proposed change to TS 3.6(3) changes the surveillance interval for the Containment Recirculating Air Cooling and Filtering System emergency mode damper, automatic valve, fan and fusible link automatic damper operation test from a Refueling interval to a Staggered Refueling interval. The proposed change to TS 3.7(1)c and 3.7(1)d changes the surveillance interval for the Diesel Generator load tests and manual control verification from a Refueling interval to a Staggered Refueling interval. The proposed change to TS 3.8 changes the surveillance interval for the testing of main steam isolation valves from a Refueling interval to a Staggered Refueling interval. Appropriate Bases changes are also made to support the changes to the TS.

3.0 BACKGROUND

The proposed change will revise FCS Technical Specification (TS) 3.0.2, Table 3-2, Table 3-5, 3.6, 3.7, 3.8, and the Definitions Section. This proposed change provides a risk informed alternative to the existing surveillance interval for the integrated Engineered Safety Features (ESF) and Loss of Offsite Power (LOOP) testing required to be performed on each ESF equipment train each outage. The proposed change modifies the surveillance interval requirement for these refueling interval Surveillance Requirements to go to a Staggered Test Basis scheme. Using a Staggered Test Basis, only one train would be tested each refueling outage. This amendment is modeled after the Improved Standard Technical Specifications (ISTS) and is based on a study conducted by the Westinghouse Electric Company, LLC on behalf of the Combustion Engineering Owners Group (CEOG) in topical report WCAP-15830-P, "Staggered Integrated ESF Testing," and Technical Specification Task Force (TSTF) 450.

This proposed change addresses the systems covered by the integrated ESF test, the ESF logic modules, and the diesel generators. The intent of the proposed amendment is to extend and stagger the integrated ESF testing surveillance intervals. The scope and methods used in the surveillances will be unchanged. Extending the surveillance interval will increase the likelihood of an undetected equipment failure. The change in plant risk is analyzed and quantified for individual plants using probabilistic risk assessment (PRA) techniques.

First, the analysis identifies the surveillances, components, and functions addressed by this test.

Next, each tested component/function is analyzed to determine if that component is tested or proven operable by other means. If an alternative test or activity proves the

component/function operable, then the component/function is categorized as needing no further analysis.

Finally, for the remaining components/functions – those not tested by means other than this test, the plant-specific PRA will be adjusted for the increased surveillance interval. The risk associated with the increased surveillance interval is then quantified.

Deterministically, the proposed change is supported by the defense-in-depth basis that is incorporated into the plant design as well as in the approach to maintenance and operation.

Basis for Proposed Changes

This proposed change addresses several needs and concerns identified in Reference 10.2. It will foster improvements in the following areas without adversely impacting plant risk and safety:

- Reduce potential for transients
- Reduce human performance challenges
- Reduce personnel radiation exposure (ALARA)
- Reduce Reactor Coolant System (RCS) mass addition challenges
- Reduce wear and tear on plant equipment
- Reduce challenges to safety equipment
- Reduce potential for personnel injury
- Reduce critical path and Operating and Maintenance (O&M) costs

Reduction in Potential for Transients

The potential for unexpected transients is increased during the period of time when the plant is being lined up for the Integrated ESF surveillance, through test performance, and restoration following the test. This potential results from the need to establish special test conditions to perform the test while maintaining safe shutdown conditions. Examples of special conditions include: abnormal valve alignments, installing jumpers, lifting leads, and placing breakers in "TEST" position. Within the industry, transients that have occurred concurrent with integrated ESF testing include: inadvertently transferring water to the containment sump, exceeding the minimum required boric acid inventory in the boric Acid Storage Tanks, overflowing the Radioactive Waste Storage Tank, and exceeding the maximum overpressure in the Volume Control Tank. Reducing the amount of testing (one train versus both trains) will reduce the potential for these and similar transients during the refueling outage.

Reduction in Human Performance Challenges

During a typical refueling outage, there are extra personnel in the plant performing a variety of tasks. Many systems/components are tagged out to support outage maintenance activities. Events have occurred as a result of breakdowns in communications and administrative controls, which have challenged plant staff to maintain configuration control of the plant. For example, there have been conflicts when performing pre-test system alignment and clearing tags to return a component service. Although Combustion Engineering (CE) plants have successfully managed these challenges, reducing the amount of required testing and abnormal system alignments to support the testing will help reduce the human performance pressure on plant personnel as they strive to do the work and at the same time maintain the plant safely shutdown. Staggered integrated testing will improve scheduling and coordination of outage activities centered on safety related equipment maintenance minimizing impacts on shutdown safety. It also will reduce the number of potential challenges to containment closure.

In addition, execution of the integrated ESF testing demands very close timing and coordination among those involved in supporting the test. Frequently, a portion of the test will have to be repeated because of inadvertently starting a stop watch or data recorder at other than the required time. Unplanned repetitive testing due to issues such as missing a data point creates extra stress on the test crew and results in unnecessary wear and tear on safety equipment. Reducing the amount of integrated ESF testing during the outage will reduce stress on plant operators and equipment.

Reduction in RCS Mass Additions Challenges

Integrated testing involves testing the response of an entire ESF train to various actuation signals, either with or without offsite power available. This includes starting the high pressure safety injection (HPSI), low pressure safety injection (LPSI), and containment spray (CS) pumps on minimum-flow recirculation. System pre-test alignments are designed to avoid moving water into the primary system. However, these high head pumps are more than capable of injecting water into the RCS if an isolation valve or check valve leaks-by or is misaligned. Primary system conditions during the test are cold and depressurized. Therefore, the potential exists for low – temperature overpressure conditions if the RCS is inadvertently pressurized by one of these pumps. Such overpressurization would not be expected to occur, since the pressurizer will be vented and low temperature overpressurization protection will be in effect. Nevertheless, it is important to always strive to minimize the opportunities for inadvertent mass additions to the primary system while shutdown. Staggered integrated ESF testing supports this objective.

Reduction in Challenges to Safety Equipment and Plant Security

As mentioned previously, by reducing the amount of integrated ESF testing the number of times components will be cycled for testing will be reduced. One complete train of safeguards equipment will be available throughout the outage since it will no longer be necessary to switch protected trains to support testing of the entire system. Having the same protected train for the entire outage will enhance safety by making it easier for plant personnel to keep track of the protected train, thus reducing the likelihood of certain human-performance errors.

There have been a few events in which the plant vulnerability to single active failures has unknowingly increased by inadequate procedural controls when establishing the required configuration and alignment for the test.

In addition, reducing the amount of integrated ESF testing will reduce the number of events related to site security systems and procedures. There have been occasions when security systems/equipment have been inadvertently removed from service during testing due to failures in electrical power supplies or transfer devices. Back up procedures exist to deal with these situations, but the situations will be less likely with the reduced test Frequency.

Reduction in Safety Equipment Wear and Tear

By necessity, ESF system equipment is exercised and operated during testing, since proving OPERABILITY is the primary purpose of periodic testing. However, for the reasons mentioned above, sometimes it is necessary to repeat a complete test or part of the test for reasons that are relatively minor or insignificant, or could be accomplish by other means. It is this additional wear-and-tear on equipment that could be limited by reducing the amount of integrated testing performed during the outage.

Also, by necessity, the HPSI, LPSI and CS pumps must be operated for a period of time with only minimum recirculation flow. The pumps are designed to operate in this condition, but it is desirable to limit the duration of operation at low flow rate to the extent possible. On the other hand, large pumps such as component cooling water and service water may be operated at high flow and low discharge pressure during the test, because they are aligned to support both shutdown cooling and ECCS loads. This operating condition also contributes to wear and tear on the pumps and system components.

Reduction in Potential for Personnel Injury

Setting up for and restoration from integrated safeguards testing requires a number of off-normal conditions to be established by plant operators and technicians. For

example, breakers need to be moved in and out of "TEST" position, fuses pulled, leads lifted or jumpers installed. Test connections and recorders must be installed to support data collection. Valve alignments, requiring access to remote locations within the auxiliary building and the containment, must be executed. During the test, operators must be stationed in remote locations to observe equipment response and collect data. Many of these actions also require independent verifications. Many of these activities could place the operator or technician in an injury prone situation. The hazards include electrical shock, burns, and injury to the eyes or injury from a fall. By reducing the amount of testing, the amount of exposure to personnel injury will also be reduced.

Reduction in Radiation Dose to Personnel (ALARA)

Setting up for and restoration from integrated safeguards testing requires a number of off-normal conditions to be established by operators and technicians. Valve alignments may require accessing radiation areas or contaminated areas in the auxiliary building and the containment. During the test, operators may also have to be stationed in these remote locations to observe equipment response and collect data. Many of these actions also require independent verifications. Therefore, radiation exposure is an expected result of running the test. The proposed change to a staggered test interval would reduce the amount of testing and result in a proportional savings in avoidable exposure. This would help the plant realize the lowest achievable radiation exposure for the outage.

Reduction in Operation and Maintenance Costs

Integrated ESF testing is the most expensive test performed during the outage. It is expensive because it takes a large amount of time and resources to execute safely. Because the test is considered an infrequent test, a separate dedicated team is deployed. The team is assembled several days prior to the test for training. The training is very detailed and includes operations, maintenance, engineering, quality assurance and health physics personnel. Many activities must be coordinated. The team is used to perform the pre-test activities, execute the test and restore systems to normal after the test. By cutting the integrated testing each outage in half, thousands of dollars in labor costs can be saved each outage.

ADDRESSED BY THE TOPICAL REPORT

The ESF actuation system initiates the start of ESF equipment which protects the public and plant personnel from the accidental release of radioactive fission products in the unlikely event of a loss-of-coolant, main steam line break or loss of feedwater accident. The safety features function to localize, control, mitigate, and terminate such incidents in order to minimize radiation exposure levels for the general public.

The ESF actuation system initiates necessary safety systems, based upon the values of selected unit parameters, to protect against violating core design limits and the RCS pressure boundary and to mitigate accidents. The ESF actuation system contains devices and circuitry that generate the signals when the monitored variables reach levels that are indicative of conditions requiring protective action. The actuation system can also initiate safety system responses using a manual push button.

The unit Class 1E Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (diesel generators (DGs)). As required by FCS Design Criterion 39, *Emergency Power for Engineered Safety Features*, (which is similar to 10 CFR 50, Appendix A, General Design Criterion (GDC) 17, *Electric power systems*), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the ESF systems.

Integrated ESF testing, with or without offsite power, is currently performed on both ESF trains every refueling outage. Many of the components and functions covered by the integrated test are tested on a more frequent basis by other surveillance tests. In cases where the integrated ESF test is the sole test to demonstrate Operability, a risk review and evaluation has been performed to confirm that the change in risk associated with extending the surveillance interval is acceptable.

4.0 REGULATORY REQUIREMENTS & GUIDANCE

The changes to TS 3.0.2, Table 3-2, Table 3-5, 3.6, 3.7, 3.8, and the Definitions Section satisfy FCS Design Criterion 15, *Engineered Safety Features Protection System*, Criterion 24, *Emergency Power for Protection Systems*, Criterion 37, *Engineered Safety Features Basis For Design*, Criterion 38, *Reliability And Testability Of Engineered Safety Features*, Criterion 39, *Emergency Power for Engineered Safety Features*, Criterion 41, *Engineered Safety Features Performance Capability*, and Criterion 42, *Engineered Safety Features Components Capability*, which are similar to 10 CFR 50, Appendix A, (GDC) 17, *Electric power systems*, Criterion 37, *Testing of emergency core cooling system*, and Criterion 40, *Testing of containment heat removal system*. FCS was issued a construction permit prior to May 21, 1971, and therefore the GDC is based upon the plant-specific design criterion documented in Appendix G of the FCS Updated Safety Analysis Report (Reference 10.3). These changes will ensure that proper limiting conditions for operation are entered for equipment or functional inoperability.

5.0 TECHNICAL ANALYSIS

The proposed change will reduce the Frequency of the integrated test for ESF equipment from 18 months to 18 months on a Staggered Test Basis. This will result in the test interval between successive surveillance tests of a given channel of n x 18 months, where n is the number of channels in the function and 18 months is the plant's normal refueling interval. A large number of surveillance tests are affected by this proposed change. Westinghouse has prepared a topical report to address the technical feasibility of this concept and has addressed some systems in the topical report. The remainder of the systems tested are plant specific and will be evaluated on a plant-by-plant basis using methodology similar to the methods used in the topical report.

Deterministic Assessment

All necessary ESFs are duplicated and power supplies are so arranged so that the failure to energize any one of the applicable busses, or the failure of one diesel generator to start, will not prevent the proper operation of the ESF systems.

Defense in Depth

The impact of the proposed change was evaluated and determined to be consistent with the defense-in-depth philosophy. The defense-in-depth philosophy in reactor design and operation results in multiple means to accomplish safety functions and prevent release of radioactive material.

- A reasonable balance among preventing core damage, preventing containment failure, and consequence mitigation is preserved.

  The proposed change does not affect the ability of the ESF systems to prevent core damage as described in the referenced topical report. The change does not affect containment integrity. The change neither degrades core damage prevention at the expense of containment integrity, nor does it degrade containment integrity at the expense of core damage prevention. The balance between preventing core damage and preventing containment failure is the same. Consequence mitigation remains unaffected by the proposed changes. Furthermore, no new accident or transient is introduced with the requested change, and the likelihood of an accident or transient is not impacted. Conversely, the increased surveillance interval may reduce the likelihood of a test-induced transient or accident. This last item is an unquantified benefit of the change.

- Over-reliance on programmatic activities compensates for weaknesses in plant design.

  The plant design will not be changed to accommodate the proposed interval extension. All safety systems, including the ESFAS, will still

function in the same manner with the same signals available to trip the reactor and initiate ESF functions, and there will be no reliance on additional systems, procedures, or operator actions. The calculated risk increase for these changes is very small and additional control processes are not required to compensate for any risk increase.

- System redundancy, independence, and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system.

  There is no impact on either the redundancy, independence, or diversity of the ESFAS or of the ability of the plant to respond to events with diverse systems. The ESFAS is a diverse and redundant sub-system and will remain so. There will be no change to the signals available to trip the reactor or initiate an ESFAS actuation.

- Defenses against potential common-cause-failures are maintained, and the potential for introduction of new common-cause-failure mechanisms has been assessed.

  Defenses against common-cause-failures are maintained. The interval extension requested is not sufficiently long to expect new common-cause failure mechanisms to arise. In addition, the operating environment for these components remains the same, therefore no new common-cause-failure modes are expected. In addition, backup systems and operator actions are not impacted by these changes; and there are no common cause links between the ESFAS and these backup options.

- Independence of barriers is not degraded.

  The barriers protecting the public and the independence of these barriers are maintained. With the staggered interval, it is not expected that the plant will have multiple systems out-of-service simultaneously that could lead to degradation of these barriers and an increase in risk to the public.

- Defenses against human errors are maintained.

  No new operator actions related to the interval extension are required. No additional operating or maintenance procedures have been introduced, or have to be revised (except to note the new test frequency) because of the change and no new at-power test or maintenance activities are expected to occur as a result of the change.

Safety Margins

The proposed change in test frequency does not change the compliance to any codes or standards that have been previously committed to or the margin to safety analysis acceptance criteria contained within the licensing bases.

Probabilistic Assessment

The portion of the proposed change supported by the topical report is related to the surveillance interval for integrated testing of ESF channels and emergency standby power systems with or without a concurrent LOOP. Also included are associated functions such as load shedding, automatic sequencer block loading and verification of permanently connected loads. The proposed change does not affect any associated Limiting Conditions for Operation (LCO), Applicability or Required Actions. The TSs will be changed to indicate that the surveillance may be performed on an 18 month Staggered Test Basis frequency. The TS Bases will also be changed to include a note to the reviewer stating that the applicable portions of the bases are applicable to plants adopting topical report WCAP- 15830-P, "Staggered Integrated ESF Testing". The technical basis for the proposed change is supported by this topical report.

The following explanation is a brief overview of the approach and methods used in the topical report. The approach is based on guidance contained in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-specific Changes to the Licensing Basis" (Reference 10.4). The topical report demonstrates that any change in risk will be negligible if a Staggered Test Basis Frequency is adopted for integrated ESF testing. The basic premise of the topical report is that the integrated test is not the primary or sole Operability test for the majority of the components tested. Other surveillance procedures are performed on many of these components and functions on a more frequent basis. Therefore there may be considerable overlap between these other tests and the integrated test. For the components/functions that are tested only by the integrated test, the risk associated with the change is recalculated, the risk model is adjusted, separate effects tests are performed and the overall risk is quantified. In some cases, it is possible to develop a reasonable deterministic basis for assuming the component failure mode addressed by the integrated test is not risk-significant. These components are exempted from further Probabilistic Safety Analysis (PSA) review and analysis.

A database was created for each plant to develop a matrix showing the overlap in ESF testing as related to the integrated test. Review of the data show that many of the components tested by the integrated ESF test are also tested by other, more frequently performed tests. However, there are several components or functions tested only by the integrated test. A categorization scheme was used to facilitate the evaluation of all of the components tested by each participant's integrated ESF procedure. The categorization is based on both the procedure review of all applicable plant specific TS

surveillance procedures and a review of each plant's PSA model data. This consisted of the surveillance procedures, the list of basic events from participant PSA models, miscellaneous plant engineering documents such as responses to Generic Letter 96-01 and plant drawings. A second database was prepared to combine selected elements of the procedure review database with the PSA basic elements. The purpose of this effort was to sub-categorize all components tested solely/primarily by the integrated test. A report was prepared for plant PSA staff to be used in quantifying the risk that provides consistent and concise instructions for each participant to ensure continuity. The technical details in support of the safety arguments are addressed in the topical report.

6.0 REGULATORY ANALYSIS

The topical report describes in detail how the technical analysis, including risk information, satisfies all applicable regulatory requirements and criteria.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

7.0 NO SIGNIFICANT HAZARDS CONSIDERATION

Omaha Public Power District has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. **Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No.

   The proposed change affects only the Frequency at which integrated ESF testing should be performed. This testing provides assurance that the integrated ESF response will occur as assumed in the accident analyses. Testing of the components will continue to be performed as currently specified in the Technical Specifications. The only change will be for the integrated test. This test will continue to be performed on each train of ESF equipment, however, it will be performed on a Staggered Test Basis. This means that the testing will be less frequent than currently required. However, testing seldom shows failure of the equipment to perform its safety function. Because of the complexity of performing the test, the test is most likely to be repeated for some discrepancy in the set up of the test. The detailed risk review and assessment of a longer test interval shows that the change is risk is

low or unchanged for equipment covered by the topical report. Licensees will provide acceptable risk reviews for plant specific equipment.

This test does not increase the probability of an accident previously evaluated because it is not a precursor to an accident. In addition, the test is performed in a shutdown mode, where these types of accidents are not assumed to occur. The proposed change also does not increase the consequences of an accident previously evaluated because the equipment is still demonstrated to perform its safety function in an integrated manner. One complete train of equipment will be tested every refueling interval for each train. Successful completion of the test is still required.

Therefore, the proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The proposed change affects only the Frequency at which integrated ESF testing should be performed. All more frequently performed testing is unaffected by this proposed change. No changes are being made to the equipment or to the method of equipment operation as a result of this change. No changes are being made to the tests addressed by this proposed change except the frequency.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. **Does the proposed change involve a significant reduction in a margin of safety?**

Response: No.

The proposed change affects only the surveillance interval at which integrated ESF testing should be performed. It does not impact safety system design criteria; safety system setpoint calculations or assumptions made in the safety analyses. All of the affected systems will continue to perform their safety functions as designed.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Omaha Public Power District concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

8.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or Surveillance Requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

9.0 PRECEDENCE

None

10.0 REFERENCES

10.1 NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants"
10.2 WCAP-15830-P, "Staggered Integrated ESF Testing," March 2003
10.3 FCS USAR Appendix G
10.4 Reg. Guide 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-specific Changes to the Licensing Basis"

ATTACHMENT 2

Markup of Technical Specification Pages

DEFINITIONS

$\bar{E}$ - Average Disintegration Energy

$\bar{E}$ is the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration, in MEV, for isotopes, other than iodines, with half lives greater than 15 minutes making up at least 95% of the total non-iodine radioactivity in the coolant.

Offsite Dose Calculation Manual (ODCM)

The document(s) that contain the methodology and parameters used in the calculations of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent radiation monitoring Warn/High (trip) Alarm setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain:

1) The Radiological Effluent Controls and the Radiological Environmental Monitoring Program required by Specification 5.16.

2) Descriptions of the information that should be included in the Annual Radiological Environmental Operating Reports and Annual Radioactive Effluent Release Reports required by Specifications 5.9.4.a and 5.9.4.b.

Unrestricted Area

Any area at or beyond the site boundary access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

Core Operating Limits Report (COLR)

The Core Operating Limits Report (COLR) is a Fort Calhoun Station Unit No. 1 specific document that provides core operating limits for the current operating cycle. These cycle specific core operating limits shall be determined for each reload cycle in accordance with Section 5.9.5. Plant operation within these operating limits is addressed in the individual specifications.

Staggered Test Basis

A Staggered Test Basis shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.

References

(1) USAR, Section 7.2
(2) USAR, Section 7.3
(3) WCAP-15830-P, "Staggered Integrated ESF Testing"

3.0 SURVEILLANCE REQUIREMENTS

3.0.1 Each surveillance requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

3.0.2 The surveillance intervals are defined as follows:

Notation	Title	Frequency
S	Shift	At least once per 12 hours
D	Daily	At least once per 24 hours
W	Weekly	At least once per 7 days
BW	Biweekly	At least once per 14 days
M	Monthly	At least once per 31 days
Q	Quarterly	At least once per 92 days
SA	Semiannual	At least once per 184 days
A	Annually	At least once per 366 days
R	Refueling	At least once per 18 months
SR	Staggered Refueling	At least once per 18 months on a Staggered Test Basis
P	Start up	Prior to Reactor Start up, if not completed in the previous week.

Exception to these intervals are stated in the individual Specifications.

3.0.3 The provisions of Specifications 3.0.1 and 3.0.2 are applicable to all codes and standards referenced within the Technical Specifications. The requirements of the Technical Specifications shall have precedence over the requirements of the codes and standards referenced within the Technical Specifications.

3.0.4 Surveillance Requirements shall be met during the MODES or other specified conditions in the individual Limiting Conditions for Operation, unless otherwise stated in the Surveillance Requirement. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the OPERABILITY requirements for the corresponding Limiting Condition for Operation. Failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by Specifications 3.0.1 and 3.0.2, shall constitute noncompliance with the OPERABILITY requirements for the corresponding Limiting Condition for Operation except as provided in Specification 3.0.5. The time limits of the ACTION requirements are applicable at the time it is identified that a Surveillance Requirement has not been performed. Surveillance Requirements do not have to be performed on inoperable equipment.

3.0.5 If it is discovered that a Surveillance was not performed within its specified surveillance interval, then compliance with the requirement to declare the OPERABILITY requirements for the Limiting Condition for Operation not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified surveillance interval, whichever is greater. This delay period is permitted to allow performance of the Surveillance. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

TABLE 3-2

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
1. Pressurizer Pressure Low	a.	Check	S	a. CHANNEL CHECK
	b.	Test	Q[1]P[4]	b. CHANNEL FUNCTIONAL TEST
	c.	Calibrate	R	c. CHANNEL CALIBRATION
2. Pressurizer Low Pressure Blocking Circuit	a.	Calibrate	R	a. CHANNEL CALIBRATION
3. Safety Injection Actuation Logic	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST (Simulation of PPLS or CPHS 2/4 Logic)
	b.	Test	SRR[7]	b. CHANNEL FUNCTIONAL TEST

TABLE 3-2 (continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
4. Containment Pressure High Signal	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST
	b.	Calibrate	R	b. CHANNEL CALIBRATION
5. Containment Spray Actuation Logic	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST (Simulation of PPLS and CPHS 2/4 Logic)
	b.	Test	SRR[7]	b. CHANNEL FUNCTIONAL TEST
6. Containment Radiation High Signal [2]	a.	Check	D	a. CHANNEL CHECK

TABLE 3-2 (continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
6. (continued)	b.	Test	Q	b. CHANNEL FUNCTIONAL TEST
	c.	Calibrate	R	c. Secondary and Electronic Calibration performed at refueling frequency. Primary calibration performed with exposure to radioactive sources only when required by the secondary and electronic calibration.
7. Manual Safety Injection Actuation	a.	Test	SR~~R~~	a. CHANNEL FUNCTIONAL TEST
8. Manual Containment Isolation Actuation	a.	Check	SR~~R~~	a. Observe isolation valves closure.
	b.	Test	SR~~R~~	b. CHANNEL FUNCTIONAL TEST
9. Manual Containment Spray Actuation	a.	Test	SR~~R~~	a. CHANNEL FUNCTIONAL TEST
10. Automatic Load Sequencers	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST

11. Diesel Testing See Technical Specification 3.7

TABLE 3-2 (continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
18. SIRW Tank Temperature	a.	Check	D(6)	a. Verify that temperature is within limits.
	b.	Test	R	b. Measure temperature of SIRW tank with standard laboratory instruments.
19. Manual Recirculation Actuation	a.	Test	SRR	a. CHANNEL FUNCTIONAL TEST
20. Recirculation Actuation Logic	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST
	b.	Test	SRR(7)	b. CHANNEL FUNCTIONAL TEST
*21. 4.16 KV Emergency Bus Low Voltage (Loss of Voltage and Degraded Voltage) Actuation Logic	a.	Check	S	a. Verify voltage readings are above alarm initiation on degraded voltage level - supervisory lights "on".
	b.	Test	Q	b. CHANNEL FUNCTIONAL TEST (Undervoltage relay)
	c.	Calibrate	R	c. CHANNEL CALIBRATION
22. Manual Emergency Off-site Power Low Trip Actuation	a.	Test	SRR	a. CHANNEL FUNCTIONAL TEST

TABLE 3-5 (continued)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

Test	Frequency	USAR Section Reference
10a. (continued) 2. Laboratory Testing** Verify, within 31 days after removal, that a laboratory test of a sample of the charcoal adsorber, when obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows methyliodide penetration less than 0.175% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.	On a refueling frequency or every 720 hours of system operation or after any structural maintenance on the HEPA filter or charcoal adsorber housing or following significant painting, fire or chemical release in a ventilation zone communicating with the system.	
3. Overall System Operation		
a. Each circuit shall be operated.	Ten hours every month.	
b. The pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 9 inches of water at system design flow rate.	R	
c. Fan shall be shown to operate within ± 10% design flow.	R	
4. Automatic and manual initiation of the system shall be demonstrated.	SR ~~R~~	

**Tests shall be performed in accordance with applicable section(s) of ANSI N510-1980.

TABLE 3-5 (Continued)

			Test	Frequency	USAR Section Reference
10c.	(continued)	4.	Automatic and/or manual initiation of the system shall be demonstrated.	R	
11.	Containment Ventilation System Fusible Linked Dampers	1.	Demonstrate damper action.	1 year, 2 years, 5 years, and every 5 years thereafter.	9.10
		2.	Test a spare fusible link.		
12.	Diesel Generator Under-Voltage Relays		Calibrate	R	8.4.3
13.	Motor Operated Safety Injection Loop Valve Motor Starters (HCV-311, 314, 317, 320, 327, 329, 331, 333, 312, 315, 318, 321)		Verify the contactor pickup value at ≤85% of 460 V.	R	
14.	Pressurizer Heaters		Verify control circuits operation for post-accident heater use.	SR ~~R~~	
15.	Spent Fuel Pool Racks		Test neutron poison samples for dimensional change, weight, neutron attenuation change and specific gravity change.	1, 2, 4, 7, and 10 years after installation, and every 5 years thereafter.	
16.	Reactor Coolant Gas Vent System	1.	Verify all manual isolation valves in each vent path are in the open position.	During each refueling outage just prior to plant start-up.	
		2.	Cycle each automatic valve in the vent path through at least one complete cycle of full travel from the control room. Verification of valve cycling may be determined by observation of position indicating lights.	R	
		3.	Verify flow through the reactor coolant vent system vent paths.	R	

3.0 SURVEILLANCE REQUIREMENTS

3.6 Safety Injection and Containment Cooling Systems Tests

Applicability

Applies to the safety injection system, the containment spray system, the containment cooling system and air filtration system inside the containment.

Objective

To verify that the subject systems will respond promptly and perform their intended functions, if required.

Specifications

(1) Safety Injection System

System tests shall be performed on an 18 month Staggered Test Basis ~~a refueling~~ frequency. A test safety feature actuation signal will be applied to initiate operation of the system. The safety injection and shutdown cooling system pump motors may be de-energized for this portion of the test.

A second overlapping test will be considered satisfactory if control board indication and visual observations indicate all components have received the safety feature actuation signal in the proper sequence and timing (i.e., the appropriate pump breakers shall have opened and closed, and all valves shall have completed their travel).

(2) Containment Spray System

a. System tests shall be performed on an 18 month Staggered Test Basis ~~a refueling~~ frequency. The test shall be performed with the isolation valves in the spray supply lines at the containment blocked closed. Operation of the system is initiated by tripping the normal actuation instrumentation.

b. At least every ten years the spray nozzles shall be verified to be open.

c. The test will be considered satisfactory if:

(i) Visual observations indicate that at least 264 nozzles per spray header have operated satisfactorily.

(ii) No more than one nozzle per spray header is missing.

d. Representative samples of Trisodium Phosphate Dodecahydrate (TSP) that have been exposed to the same environmental conditions as that in the mesh baskets shall be tested on a refueling frequency by:

3.0 **SURVEILLANCE REQUIREMENTS**

3.6 Safety Injection and Containment Cooling Systems Tests (Continued)

(3) Containment Recirculating Air Cooling and Filtering System

a. Emergency mode damper, automatic valve, fan, and fusible link automatic damper operation will be checked for operability on an 18 month Staggered Test Basis frequency ~~during each refueling outage.~~

b. Each fan and remotely operated damper required to function during accident conditions will be exercised at intervals not to exceed three months.

c. Each air filtering circuit will be operated at least 10 hours every month.

d. A visual examination of the HEPA and charcoal filters will be made during each refueling outage to insure that leak paths do not exist.

e. Measurement of pressure drop across the combined HEPA and charcoal adsorber banks shall be performed at least once per plant operating cycle to verify a pressure drop of less than 6 inches of water at system design flow.

f. Fans shall be shown to operate within +/-10% design flow during each refueling outage.

3.0 **SURVEILLANCE REQUIREMENTS**
3.6 Safety Injection and Containment Cooling Systems Tests (Continued)

Basis

The safety injection system and the containment cooling system are principal plant safeguards that are not operated during normal reactor operation.

Complete systems tests cannot be performed when the reactor is operating because a safety injection signal causes containment isolation and a containment spray system test requires the system to be temporarily disabled. The method of assuring operability of these systems is, therefore, to combine systems tests to be performed during refueling shutdowns in addition to more frequent component tests which can be performed during reactor operation.

The refueling shutdown tests performed on an 18 month Staggered Test Basis frequency demonstrate proper automatic operation of the safety injection and containment spray systems.[5] A test signal is applied to initiate automatic action and verification made that the components receive the safety injection actuation signals in the proper sequence. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry.[1] [2]

The Frequency of 18 months on a Staggered Test Basis results in the interval between successive tests of a given component of n x 18 months, where n is the number of trains and 18 months is the plant's normal refueling interval. The 18 month staggered test basis Frequency is based upon plant operating experience and risk based analyses that show that serious degradation of the response of the component is an infrequent occurrence.

During reactor operation, the instrumentation which is depended on to initiate safety injection and containment spray is generally checked daily and the initiating circuits are tested monthly. In addition, the active components (pumps and valves) are to be tested every three months to check the operation of the starting circuits and to verify that the pumps are in satisfactory running order. The test interval of three months is based on the judgement that more frequent testing would not significantly increase the reliability (i.e., the probability that the component would operate when required), yet more frequent tests would result in increased wear over a long period of time. Verification

3.0 SURVEILLANCE REQUIREMENTS

3.6 Safety Injection and Containment Cooling Systems Tests (Continued)

Operation of the system for 10 hours every month will demonstrate operability of the filters and adsorbers system and remove excessive moisture build-up on the adsorbers.

Demonstration of the automatic initiation capability will assure system availability.

Periodic determination of the volume of TSP in containment must be performed due to the possibility of leaking valves and components in the containment building that could cause dissolution of the TSP during normal operation. A refueling frequency shall be utilized to visually determine that ≥ 126 ft^3 of TSP is contained in the TSP baskets. This requirement ensures that there is an adequate quantity of TSP to adjust the pH of the post-LOCA sump solution to a value ≥ 7.0.

The periodic verification is required on a refueling frequency. Operating experience has shown this surveillance frequency acceptable due to margin in the volume of TSP placed in the containment building.

Testing must be performed to ensure the solubility and buffering ability of the TSP after exposure to the containment environment. A representative sample of 1.80 - 1.83 grams of TSP from one of the baskets in containment is submerged in 0.99 - 1.01 liters of water at a boron concentration of 2445 - 2465 ppm. At a standard temperature of 115 -125°F, without agitation, the solution should be left to stand for 4 hours. The liquid is then decanted and mixed, the temperature adjusted to 75 - 79°F and the pH measured. At this point the pH must be ≥ 7.0. The representative sample weight is based on the minimum required TSP weight of 6,672 lbs_m which, at a manufactured density of at least 53.0 lb_m/ft^3 corresponds to the minimum volume of 126 ft^3, and maximum possible post-LOCA sump volume of 375,143 gallons, normalized to buffer a 1.0 liter sample. The boron concentration of the test water is representative of the maximum possible boron concentration corresponding to the maximum possible post-LOCA sump volume. The post-LOCA sump volume originates from the Reactor Coolant System (RCS), the Safety Injection Refueling Water Tank (SIRWT), the Safety Injection Tanks (SITs) and the Boric Acid Storage Tanks (BASTs). The maximum post-LOCA sump boron concentration is based on a cumulative boron concentration in the RCS, SIRWT, SITs and BASTs of 2445 ppm. Agitation of the test solution is prohibited, since an adequate standard for the agitation intensity cannot be specified. The test time of 4 hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the post-LOCA containment sump, rapid mixing would occur, significantly decreasing the actual amount of time before the required pH is achieved. This would ensure achieving a pH ≥ 7.0 by the onset of recirculation after a LOCA.

References

(1) USAR, Section 6.2
(2) USAR, Section 6.3
(3) USAR, Section 14.16
(4) USAR, Section 6.4
(5) WCAP-15830-P, "Staggered Integrated ESF Testing"

3.0 SURVEILLANCE REQUIREMENTS
3.7 Emergency Power System Periodic Tests

Applicability

Applies to periodic testing and surveillance requirements of the emergency power system.

Objective

To verify that the emergency power system will respond promptly and properly when required.

Specifications

The following tests and surveillance shall be performed as stated:

(1) Diesel generators:

a. Each diesel engine shall be started at least once per 31 days on a staggered basis. The engine shall be run with all protective devices operable. The test shall verify that:

i. The diesel starts and accelerates to idle speed. Following a warm-up period as recommended by the manufacturer, the diesel generator will be accelerated to rated speed and voltage.

However, at least once per 184 days in these surveillance tests, the diesel generator shall demonstrate that it can be started and accelerated to rated speed and voltage in less than or equal to 10 seconds without a prior warm-up.

The signal initiated to start the diesel shall be varied from one test to another to verify all manual and auto start circuits.[1]

ii. With the diesel running at rated speed and voltage, the generator shall be synchronized with the 4.16 KV bus and the diesel breaker manually closed from the electrical control board. The generator shall then be loaded to at least the continuous[2] KW rating and run for at least 60 minutes before being off-loaded and the diesel breaker tripped.

b. The auto-start initiating circuit for each diesel shall be tested prior to each plant startup if not done during the previous week.

c. Tests shall be conducted on an 18 month Staggered Test Basis frequency ~~during each refueling outage~~ to demonstrate the satisfactory overall automatic operation of each diesel system. This test shall be conducted by:

3.0 **SURVEILLANCE REQUIREMENTS**
3.7 Emergency Power System Periodic Tests (Continued)

i. Initiation of a simulated auto-start signal to verify that the diesel starts, followed by,

ii. Initiation of a simulated simultaneous loss of 4.16 KV supplies to bus 1A3 (1A4). Proper operation will be verified by observation of:

(1) De-energization of bus 1A3 (1A4).
(2) Load shedding from bus (both 4160 V and 480 V).
(3) Energization of bus 1A3 (1A4).
(4) Automatic sequence start of emergency load, and
(5) Operation of ≥ 5 minutes while its generator is loaded with the emergency load.

iii Verification that emergency loads do not exceed the 2000-HR KW rating of the engine.(2)

d. Manual control of diesel generators and breakers shall also be verified during refueling shutdowns on a Staggered Test Basis frequency.

e. Each diesel generator shall be given a thorough inspection on a refueling (R) frequency in accordance with the manufacturer's recommendations for this class of standby service.*

f. The fuel oil transfer pumps shall be verified to be operable each month.

(2) Station Batteries

a. Every month the voltage of each cell (to the nearest 0.01 volt), the specific gravity, and temperature of a pilot cell in each battery shall be measured and recorded.(3)(4)

b. Every three months the specific gravity of each cell, the temperature reading of every fifth cell, and the amount of water added shall be measured and recorded. During the first refueling outage and every third refueling outage thereafter the batteries shall be subjected to a rated load discharge test.

c. At monthly intervals the third battery charger, which is capable of being connected to either of the two D.C. distribution buses, shall be paralleled in turn to each D.C. bus. In each case, load shall be transferred to this reserve battery charger by switching out the normal charger. The reserve charger shall be run on load for 30 minutes on each bus and the system shall finally be returned to normal.

*A one time extension has been granted for this surveillance requirement, allowing the April 1988 surveillance for Diesel Generator No. 1 to be completed in October 1988.

3.0 **SURVEILLANCE REQUIREMENTS**
3.7 Emergency Power System Periodic Tests (Continued)

d. During refueling shutdowns the correct function of all D.C. emergency transfer switches shall be demonstrated by manual transfer of normal D.C. supply breakers at the 125 volt D.C. distribution panels.

(3) Emergency Lighting

The correct functioning of the emergency lighting system required for plant safe shutdown shall be verified at least once each year.

(4) 13.8 kV Transmission Line

The 13.8 kV transmission line will be energized and loaded to minimum shutdown requirements on a refueling frequency.

(5) Inverters A, B, C, and D

The correct inverter output (voltage, frequency, and alignment to required 120 V a-c instrument buses) shall be verified weekly.

Basis

The emergency power system provides power requirements for the engineered safety features in the event of a DBA. Each of the two diesel generators is capable of supplying minimum required safety feature equipment from independent buses. This redundancy is a factor in establishing testing intervals. The monthly tests specified will demonstrate operability and load capacity of each diesel generator. These tests are conducted to meet the objectives of NRC Generic Letter 84-15 regarding the issue of reductions in cold fast starts. For this reason, the test verifying a 10 second start will be conducted from ambient conditions once per 184 days for each diesel. Other monthly tests will allow for manufacturer's recommended warm-up to reduce the mechanical stress and wear on the diesel engines. The fuel supply and various controls are continuously monitored and alarmed for off-normal conditions. Automatic starting on loss of off-site power and automatic load shedding, diesel connection, and loading will be verified on an 18 month Staggered Test Basis ~~a refueling~~ frequency.[5] At the same intervals, capability will be verified for manual emergency control of these functions from the diesel and switch-gear rooms.

The Frequency of 18 months on a Staggered Test Basis results in the interval between successive tests of a given component of n x 18 months, where n is the number of trains and 18 months is the plant's normal refueling interval. The 18 month staggered test basis Frequency is based upon plant operating experience and risk based analyses that show that serious degradation of the response of the component is an infrequent occurrence.

Considering system redundancy, the specified testing intervals for the station batteries should be adequate to detect and correct any malfunction before it can result in system malfunction. Batteries will deteriorate with time, but precipitous failure is extremely unlikely. The surveillance specified is that which has been demonstrated over the years to provide an indication of a cell becoming unserviceable long before it fails.

References

(1) USAR, Section 7.3.4.2
(2) USAR, Section 8.4.1
(3) USAR, Section 8.3.4
(4) USAR, Section 8.4.2
(5) WCAP-15830-P, "Staggered Integrated ESF Testing"

3.0 SURVEILLANCE REQUIREMENTS

3.8 Main Steam Isolation Valves

Applicability

Applies to periodic testing of the main steam isolation valves.

Objective

To verify the ability of the main steam isolation valves to close upon signal.

Specifications

The operation of the main steam isolation valves shall be tested on an 18 month Staggered Test Basis frequency ~~during each refueling outage~~ to demonstrate a closure time of four seconds or less under no-flow conditions.[1]

Basis

The main steam isolation valves serve to limit an excessive reactor coolant system cooldown rate and resultant reactivity insertion following a main steam break incident. Their ability to close upon signal will be verified on an 18 month Staggered Test Basis frequency ~~at each scheduled refueling outage.~~ [2]

The Frequency of 18 months on a Staggered Test Basis results in the interval between successive tests of a given component of n x 18 months, where n is the number of trains and 18 months is the plant's normal refueling interval. The 18 month staggered test basis Frequency is based upon plant operating experience and risk based analyses that show that serious degradation of the response of the component is an infrequent occurrence.

References

(1) USAR, Section 10.3
(2) WCAP-15830-P, "Staggered Integrated ESF Testing"

ATTACHMENT 3

Proposed
Clean-Typed
Technical Specification Pages

DEFINITIONS

$\bar{E}$ - Average Disintegration Energy

$\bar{E}$ is the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration, in MEV, for isotopes, other than iodines, with half lives greater than 15 minutes making up at least 95% of the total non-iodine radioactivity in the coolant.

Offsite Dose Calculation Manual (ODCM)

The document(s) that contain the methodology and parameters used in the calculations of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent radiation monitoring Warn/High (trip) Alarm setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain:

1) The Radiological Effluent Controls and the Radiological Environmental Monitoring Program required by Specification 5.16.

2) Descriptions of the information that should be included in the Annual Radiological Environmental Operating Reports and Annual Radioactive Effluent Release Reports required by Specifications 5.9.4.a and 5.9.4.b.

Unrestricted Area

Any area at or beyond the site boundary access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

Core Operating Limits Report (COLR)

The Core Operating Limits Report (COLR) is a Fort Calhoun Station Unit No. 1 specific document that provides core operating limits for the current operating cycle. These cycle specific core operating limits shall be determined for each reload cycle in accordance with Section 5.9.5. Plant operation within these operating limits is addressed in the individual specifications.

Staggered Test Basis

A Staggered Test Basis shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.

References

(1) USAR, Section 7.2
(2) USAR, Section 7.3
(3) WCAP-15830-P, "Staggered Integrated ESF Testing"

3.0 SURVEILLANCE REQUIREMENTS

3.0.1 Each surveillance requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

3.0.2 The surveillance intervals are defined as follows:

Notation	Title	Frequency
S	Shift	At least once per 12 hours
D	Daily	At least once per 24 hours
W	Weekly	At least once per 7 days
BW	Biweekly	At least once per 14 days
M	Monthly	At least once per 31 days
Q	Quarterly	At least once per 92 days
SA	Semiannual	At least once per 184 days
A	Annually	At least once per 366 days
R	Refueling	At least once per 18 months
SR	Staggered Refueling	At least once per 18 months on a Staggered Test Basis
P	Start up	Prior to Reactor Start up, if not completed in the previous week.

Exception to these intervals are stated in the individual Specifications.

3.0.3 The provisions of Specifications 3.0.1 and 3.0.2 are applicable to all codes and standards referenced within the Technical Specifications. The requirements of the Technical Specifications shall have precedence over the requirements of the codes and standards referenced within the Technical Specifications.

3.0.4 Surveillance Requirements shall be met during the MODES or other specified conditions in the individual Limiting Conditions for Operation, unless otherwise stated in the Surveillance Requirement. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the OPERABILITY requirements for the corresponding Limiting Condition for Operation. Failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by Specifications 3.0.1 and 3.0.2, shall constitute noncompliance with the OPERABILITY requirements for the corresponding Limiting Condition for Operation except as provided in Specification 3.0.5. The time limits of the ACTION requirements are applicable at the time it is identified that a Surveillance Requirement has not been performed. Surveillance Requirements do not have to be performed on inoperable equipment.

3.0.5 If it is discovered that a Surveillance was not performed within its specified surveillance interval, then compliance with the requirement to declare the OPERABILITY requirements for the Limiting Condition for Operation not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified surveillance interval, whichever is greater. This delay period is permitted to allow performance of the Surveillance. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

TABLE 3-2

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
1. Pressurizer Pressure Low	a.	Check	S	a. CHANNEL CHECK
	b.	Test	Q(1)P(4)	b. CHANNEL FUNCTIONAL TEST
	c.	Calibrate	R	c. CHANNEL CALIBRATION
2. Pressurizer Low Pressure Blocking Circuit	a.	Calibrate	R	a. CHANNEL CALIBRATION
3. Safety Injection Actuation Logic	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST (Simulation of PPLS or CPHS 2/4 Logic)
	b.	Test	SR(7)	b. CHANNEL FUNCTIONAL TEST

TABLE 3-2 (continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
4. Containment Pressure High Signal	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST
	b.	Calibrate	R	b. CHANNEL CALIBRATION
5. Containment Spray Actuation Logic	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST (Simulation of PPLS and CPHS 2/4 Logic)
	b.	Test	SR [(7)]	b. CHANNEL FUNCTIONAL TEST
6. Containment Radiation High Signal [(2)]	a.	Check	D	a. CHANNEL CHECK

TABLE 3-2 (continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
6. (continued)	b.	Test	Q	b. CHANNEL FUNCTIONAL TEST
	c.	Calibrate	R	c. Secondary and Electronic Calibration performed at refueling frequency. Primary calibration performed with exposure to radioactive sources only when required by the secondary and electronic calibration.
7. Manual Safety Injection Actuation	a.	Test	SR	a. CHANNEL FUNCTIONAL TEST
8. Manual Containment Isolation Actuation	a.	Check	SR	a. Observe isolation valves closure.
	b.	Test	SR	b. CHANNEL FUNCTIONAL TEST
9. Manual Containment Spray Actuation	a.	Test	SR	a. CHANNEL FUNCTIONAL TEST
10. Automatic Load Sequencers	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST
11. Diesel Testing	See Technical Specification 3.7			

TABLE 3-2 (continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTING OF ENGINEERED SAFETY FEATURES, INSTRUMENTATION AND CONTROLS

Channel Description	Surveillance Function		Frequency	Surveillance Method
18. SIRW Tank Temperature	a.	Check	D(6)	a. Verify that temperature is within limits.
	b.	Test	R	b. Measure temperature of SIRW tank with standard laboratory instruments.
19. Manual Recirculation Actuation	a.	Test	SR	a. CHANNEL FUNCTIONAL TEST
20. Recirculation Actuation Logic	a.	Test	Q	a. CHANNEL FUNCTIONAL TEST
	b.	Test	SR (7)	b. CHANNEL FUNCTIONAL TEST
*21. 4.16 KV Emergency Bus Low Voltage (Loss of Voltage and Degraded Voltage) Actuation Logic	a.	Check	S	a. Verify voltage readings are above alarm initiation on degraded voltage level - supervisory lights "on".
	b.	Test	Q	b. CHANNEL FUNCTIONAL TEST (Undervoltage relay)
	c.	Calibrate	R	c. CHANNEL CALIBRATION
22. Manual Emergency Off-site Power Low Trip Actuation	a.	Test	SR	a. CHANNEL FUNCTIONAL TEST

TABLE 3-5 (continued)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

	Test	Frequency	USAR Section Reference
10a. (continued)	2. Laboratory Testing** Verify, within 31 days after removal, that a laboratory test of a sample of the charcoal adsorber, when obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows methyliodide penetration less than 0.175% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.	On a refueling frequency or every 720 hours of system operation or after any structural maintenance on the HEPA filter or charcoal adsorber housing or following significant painting, fire or chemical release in a ventilation zone communicating with the system.	
	3. Overall System Operation		
	a. Each circuit shall be operated.	Ten hours every month.	
	b. The pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 9 inches of water at system design flow rate.	R	
	c. Fan shall be shown to operate within ± 10% design flow.	R	
	4. Automatic and manual initiation of the system shall be demonstrated.	SR	

**Tests shall be performed in accordance with applicable section(s) of ANSI N510-1980.

TABLE 3-5 (Continued)

			Test	Frequency	USAR Section Reference
10c.	(continued)	4.	Automatic and/or manual initiation of the system shall be demonstrated.	R	
11.	Containment Ventilation System Fusible Linked Dampers	1.	Demonstrate damper action.	1 year, 2 years, 5 years, and every 5 years thereafter.	9.10
		2.	Test a spare fusible link.		
12.	Diesel Generator Under-Voltage Relays		Calibrate	R	8.4.3
13.	Motor Operated Safety Injection Loop Valve Motor Starters (HCV-311, 314, 317, 320, 327, 329, 331, 333, 312, 315, 318, 321)		Verify the contactor pickup value at $\leq$85% of 460 V.	R	
14.	Pressurizer Heaters		Verify control circuits operation for post-accident heater use.	SR	
15.	Spent Fuel Pool Racks		Test neutron poison samples for dimensional change, weight, neutron attenuation change and specific gravity change.	1, 2, 4, 7, and 10 years after installation, and every 5 years thereafter.	
16.	Reactor Coolant Gas Vent System	1.	Verify all manual isolation valves in each vent path are in the open position.	During each refueling outage just prior to plant start-up.	
		2.	Cycle each automatic valve in the vent path through at least one complete cycle of full travel from the control room. Verification of valve cycling may be determined by observation of position indicating lights.	R	
		3.	Verify flow through the reactor coolant vent system vent paths.	R	

3.0 SURVEILLANCE REQUIREMENTS
3.6 Safety Injection and Containment Cooling Systems Tests

Applicability

Applies to the safety injection system, the containment spray system, the containment cooling system and air filtration system inside the containment.

Objective

To verify that the subject systems will respond promptly and perform their intended functions, if required.

Specifications

(1) Safety Injection System

System tests shall be performed on an 18 month Staggered Test Basis frequency. A test safety feature actuation signal will be applied to initiate operation of the system. The safety injection and shutdown cooling system pump motors may be de-energized for this portion of the test.

A second overlapping test will be considered satisfactory if control board indication and visual observations indicate all components have received the safety feature actuation signal in the proper sequence and timing (i.e., the appropriate pump breakers shall have opened and closed, and all valves shall have completed their travel).

(2) Containment Spray System

a. System tests shall be performed on an 18 month Staggered Test Basis frequency. The test shall be performed with the isolation valves in the spray supply lines at the containment blocked closed. Operation of the system is initiated by tripping the normal actuation instrumentation.

b. At least every ten years the spray nozzles shall be verified to be open.

c. The test will be considered satisfactory if:

(i) Visual observations indicate that at least 264 nozzles per spray header have operated satisfactorily.

(ii) No more than one nozzle per spray header is missing.

d. Representative samples of Trisodium Phosphate Dodecahydrate (TSP) that have been exposed to the same environmental conditions as that in the mesh baskets shall be tested on a refueling frequency by:

3.0 **SURVEILLANCE REQUIREMENTS**
3.6 Safety Injection and Containment Cooling Systems Tests (Continued)

(3) Containment Recirculating Air Cooling and Filtering System

a. Emergency mode damper, automatic valve, fan, and fusible link automatic damper operation will be checked for operability on an 18 month Staggered Test Basis frequency.

b. Each fan and remotely operated damper required to function during accident conditions will be exercised at intervals not to exceed three months.

c. Each air filtering circuit will be operated at least 10 hours every month.

d. A visual examination of the HEPA and charcoal filters will be made during each refueling outage to insure that leak paths do not exist.

e. Measurement of pressure drop across the combined HEPA and charcoal adsorber banks shall be performed at least once per plant operating cycle to verify a pressure drop of less than 6 inches of water at system design flow.

f. Fans shall be shown to operate within +/-10% design flow during each refueling outage.

3.0 SURVEILLANCE REQUIREMENTS

3.6 Safety Injection and Containment Cooling Systems Tests (Continued)

Basis

The safety injection system and the containment cooling system are principal plant safeguards that are not operated during normal reactor operation.

Complete systems tests cannot be performed when the reactor is operating because a safety injection signal causes containment isolation and a containment spray system test requires the system to be temporarily disabled. The method of assuring operability of these systems is, therefore, to combine systems tests to be performed during refueling shutdowns in addition to more frequent component tests which can be performed during reactor operation.

The refueling shutdown tests performed on an 18 month Staggered Test Basis frequency demonstrate proper automatic operation of the safety injection and containment spray systems.[5] A test signal is applied to initiate automatic action and verification made that the components receive the safety injection actuation signals in the proper sequence. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry.[1][2]

The Frequency of 18 months on a Staggered Test Basis results in the interval between successive tests of a given component of n x 18 months, where n is the number of trains and 18 months is the plant's normal refueling interval. The 18 month staggered test basis Frequency is based upon plant operating experience and risk based analyses that show that serious degradation of the response of the component is an infrequent occurrence.

During reactor operation, the instrumentation which is depended on to initiate safety injection and containment spray is generally checked daily and the initiating circuits are tested monthly. In addition, the active components (pumps and valves) are to be tested every three months to check the operation of the starting circuits and to verify that the pumps are in satisfactory running order. The test interval of three months is based on the judgement that more frequent testing would not significantly increase the reliability (i.e., the probability that the component would operate when required), yet more frequent tests would result in increased wear over a long period of time. Verification

3.0 SURVEILLANCE REQUIREMENTS
3.6 Safety Injection and Containment Cooling Systems Tests (Continued)

Operation of the system for 10 hours every month will demonstrate operability of the filters and adsorbers system and remove excessive moisture build-up on the adsorbers.

Demonstration of the automatic initiation capability will assure system availability.

Periodic determination of the volume of TSP in containment must be performed due to the possibility of leaking valves and components in the containment building that could cause dissolution of the TSP during normal operation. A refueling frequency shall be utilized to visually determine that ≥ 126 ft^3 of TSP is contained in the TSP baskets. This requirement ensures that there is an adequate quantity of TSP to adjust the pH of the post-LOCA sump solution to a value ≥ 7.0.

The periodic verification is required on a refueling frequency. Operating experience has shown this surveillance frequency acceptable due to margin in the volume of TSP placed in the containment building.

Testing must be performed to ensure the solubility and buffering ability of the TSP after exposure to the containment environment. A representative sample of 1.80 - 1.83 grams of TSP from one of the baskets in containment is submerged in 0.99 - 1.01 liters of water at a boron concentration of 2445 - 2465 ppm. At a standard temperature of 115 -125°F, without agitation, the solution should be left to stand for 4 hours. The liquid is then decanted and mixed, the temperature adjusted to 75 - 79°F and the pH measured. At this point the pH must be ≥ 7.0. The representative sample weight is based on the minimum required TSP weight of 6,672 lbs_m which, at a manufactured density of at least 53.0 lb_m/ft^3 corresponds to the minimum volume of 126 ft^3, and maximum possible post-LOCA sump volume of 375,143 gallons, normalized to buffer a 1.0 liter sample. The boron concentration of the test water is representative of the maximum possible boron concentration corresponding to the maximum possible post-LOCA sump volume. The post-LOCA sump volume originates from the Reactor Coolant System (RCS), the Safety Injection Refueling Water Tank (SIRWT), the Safety Injection Tanks (SITs) and the Boric Acid Storage Tanks (BASTs). The maximum post-LOCA sump boron concentration is based on a cumulative boron concentration in the RCS, SIRWT, SITs and BASTs of 2445 ppm. Agitation of the test solution is prohibited, since an adequate standard for the agitation intensity cannot be specified. The test time of 4 hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the post-LOCA containment sump, rapid mixing would occur, significantly decreasing the actual amount of time before the required pH is achieved. This would ensure achieving a pH ≥ 7.0 by the onset of recirculation after a LOCA.

References

(1) USAR, Section 6.2
(2) USAR, Section 6.3
(3) USAR, Section 14.16
(4) USAR, Section 6.4
(5) WCAP-15830-P, "Staggered Integrated ESF Testing"

3.0 SURVEILLANCE REQUIREMENTS

3.7 Emergency Power System Periodic Tests

Applicability

Applies to periodic testing and surveillance requirements of the emergency power system.

Objective

To verify that the emergency power system will respond promptly and properly when required.

Specifications

The following tests and surveillance shall be performed as stated:

(1) Diesel generators:

a. Each diesel engine shall be started at least once per 31 days on a staggered basis. The engine shall be run with all protective devices operable. The test shall verify that:

i. The diesel starts and accelerates to idle speed. Following a warm-up period as recommended by the manufacturer, the diesel generator will be accelerated to rated speed and voltage.

However, at least once per 184 days in these surveillance tests, the diesel generator shall demonstrate that it can be started and accelerated to rated speed and voltage in less than or equal to 10 seconds without a prior warm-up.

The signal initiated to start the diesel shall be varied from one test to another to verify all manual and auto start circuits.[1]

ii. With the diesel running at rated speed and voltage, the generator shall be synchronized with the 4.16 KV bus and the diesel breaker manually closed from the electrical control board. The generator shall then be loaded to at least the continuous[2] KW rating and run for at least 60 minutes before being off-loaded and the diesel breaker tripped.

b. The auto-start initiating circuit for each diesel shall be tested prior to each plant startup if not done during the previous week.

c. Tests shall be conducted on an 18 month Staggered Test Basis frequency to demonstrate the satisfactory overall automatic operation of each diesel system. This test shall be conducted by:

3.0 **SURVEILLANCE REQUIREMENTS**
3.7 Emergency Power System Periodic Tests (Continued)

i. Initiation of a simulated auto-start signal to verify that the diesel starts, followed by,

ii. Initiation of a simulated simultaneous loss of 4.16 KV supplies to bus 1A3 (1A4). Proper operation will be verified by observation of:

(1) De-energization of bus 1A3 (1A4).
(2) Load shedding from bus (both 4160 V and 480 V).
(3) Energization of bus 1A3 (1A4).
(4) Automatic sequence start of emergency load, and
(5) Operation of $\geq$ 5 minutes while its generator is loaded with the emergency load.

iii Verification that emergency loads do not exceed the 2000-HR KW rating of the engine.(2)

d. Manual control of diesel generators and breakers shall also be verified during refueling shutdowns on a Staggered Test Basis frequency.

e. Each diesel generator shall be given a thorough inspection on a refueling (R) frequency in accordance with the manufacturer's recommendations for this class of standby service.*

f. The fuel oil transfer pumps shall be verified to be operable each month.

(2) Station Batteries

a. Every month the voltage of each cell (to the nearest 0.01 volt), the specific gravity, and temperature of a pilot cell in each battery shall be measured and recorded.(3)(4)

b. Every three months the specific gravity of each cell, the temperature reading of every fifth cell, and the amount of water added shall be measured and recorded. During the first refueling outage and every third refueling outage thereafter the batteries shall be subjected to a rated load discharge test.

c. At monthly intervals the third battery charger, which is capable of being connected to either of the two D.C. distribution buses, shall be paralleled in turn to each D.C. bus. In each case, load shall be transferred to this reserve battery charger by switching out the normal charger. The reserve charger shall be run on load for 30 minutes on each bus and the system shall finally be returned to normal.

*A one time extension has been granted for this surveillance requirement, allowing the April 1988 surveillance for Diesel Generator No. 1 to be completed in October 1988.

3.0 SURVEILLANCE REQUIREMENTS
3.7 Emergency Power System Periodic Tests (Continued)

d. During refueling shutdowns the correct function of all D.C. emergency transfer switches shall be demonstrated by manual transfer of normal D.C. supply breakers at the 125 volt D.C. distribution panels.

(4) Emergency Lighting

The correct functioning of the emergency lighting system required for plant safe shutdown shall be verified at least once each year.

(4) 13.8 kV Transmission Line

The 13.8 kV transmission line will be energized and loaded to minimum shutdown requirements on a refueling frequency.

(6) Inverters A, B, C, and D

The correct inverter output (voltage, frequency, and alignment to required 120 V a-c instrument buses) shall be verified weekly.

Basis

The emergency power system provides power requirements for the engineered safety features in the event of a DBA. Each of the two diesel generators is capable of supplying minimum required safety feature equipment from independent buses. This redundancy is a factor in establishing testing intervals. The monthly tests specified will demonstrate operability and load capacity of each diesel generator. These tests are conducted to meet the objectives of NRC Generic Letter 84-15 regarding the issue of reductions in cold fast starts. For this reason, the test verifying a 10 second start will be conducted from ambient conditions once per 184 days for each diesel. Other monthly tests will allow for manufacturer's recommended warm-up to reduce the mechanical stress and wear on the diesel engines. The fuel supply and various controls are continuously monitored and alarmed for off-normal conditions. Automatic starting on loss of off-site power and automatic load shedding, diesel connection, and loading will be verified on an 18 month Staggered Test Basis frequency.[5] At the same intervals, capability will be verified for manual emergency control of these functions from the diesel and switch-gear rooms.

The Frequency of 18 months on a Staggered Test Basis results in the interval between successive tests of a given component of n x 18 months, where n is the number of trains and 18 months is the plant's normal refueling interval. The 18 month staggered test basis Frequency is based upon plant operating experience and risk based analyses that show that serious degradation of the response of the component is an infrequent occurrence.

Considering system redundancy, the specified testing intervals for the station batteries should be adequate to detect and correct any malfunction before it can result in system malfunction. Batteries will deteriorate with time, but precipitous failure is extremely unlikely. The surveillance specified is that which has been demonstrated over the years to provide an indication of a cell becoming unserviceable long before it fails.

3.0 SURVEILLANCE REQUIREMENTS
3.7 Emergency Power System Periodic Tests (Continued)

References
(1) USAR, Section 7.3.4.2
(2) USAR, Section 8.4.1
(3) USAR, Section 8.3.4
(4) USAR, Section 8.4.2
(5) WCAP-15830-P, “Staggered Integrated ESF Testing”

3.0 SURVEILLANCE REQUIREMENTS

3.8 Main Steam Isolation Valves

Applicability

Applies to periodic testing of the main steam isolation valves.

Objective

To verify the ability of the main steam isolation valves to close upon signal.

Specifications

The operation of the main steam isolation valves shall be tested on an 18 month Staggered Test Basis frequency to demonstrate a closure time of four seconds or less under no-flow conditions.[(1]

Basis

The main steam isolation valves serve to limit an excessive reactor coolant system cooldown rate and resultant reactivity insertion following a main steam break incident. Their ability to close upon signal will be verified on an 18 month Staggered Test Basis frequency. [2)]

The Frequency of 18 months on a Staggered Test Basis results in the interval between successive tests of a given component of n x 18 months, where n is the number of trains and 18 months is the plant's normal refueling interval. The 18 month staggered test basis Frequency is based upon plant operating experience and risk based analyses that show that serious degradation of the response of the component is an infrequent occurrence.

References

(1) USAR, Section 10.3
(2) WCAP-15830-P, "Staggered Integrated ESF Testing"