Industry/TSTF Standard Technical Specification Change Traveler

Staggered Integrated ESFAS Testing (WCAP-15830)

NUREGs Affected: ☐ 1430 ☐ 1431 ☑ 1432 ☐ 1433 ☐ 1434

Classification 1) Technical Change

Recommended for CLIIP?: Yes

Priority 1)High

Simple or Complex Change: Complex

Correction or Improvement: Improvement

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See attached.

Revision History

OG Revision 0 Revision Status: Active Next Action: NRC

Revision Proposed by: Calvert Cliffs

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 18-Mar-03

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 18-Mar-03

TSTF Review Information

TSTF Received Date: 18-Mar-03 Date Distributed for Review 31-Mar-03

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:

Approved with changes. The following changes were made:

1) Various editorial changes to the justification and inserts.

2) Added Insert M, which applies to Specification 3.3.5 (Analog) and 3.3.6 (Digital) to correctly reference channels for each Function instead of trains.

3) Revised inserts A through L to eliminate the phrase "in the function."

4) Revised inserts C, G, H, I, J, K, and L to clearly describe the number of trains used to determine the STAGGERED TEST BASIS Frequency.

TSTF Resolution: Approved Date: 09-Apr-03

NRC Review Information

NRC Received Date: 16-Jun-03

OG Revision 0 **Revision Status: Active** **Next Action: NRC**

Affected Technical Specifications

Ref. 3.3.5 Bases	ESFAS Logic and Manual Trip (Analog)
SR 3.3.5.2	ESFAS Logic and Manual Trip (Analog)
SR 3.3.5.2 Bases	ESFAS Logic and Manual Trip (Analog)
Ref. 3.3.6 Bases	ESFAS Logic and Manual Trip (Digital)
SR 3.3.6.3	ESFAS Logic and Manual Trip (Digital)
SR 3.3.6.3 Bases	ESFAS Logic and Manual Trip (Digital)
Ref. 3.5.2 Bases	ECCS - Operating
SR 3.5.2.6	ECCS - Operating
SR 3.5.2.6 Bases	ECCS - Operating Change Description: Bases applies to 3.5.2.6, 3.5.2.7, and 3.5.2.8
SR 3.5.2.7	ECCS - Operating
Ref. 3.6.3 Bases	Containment Isolation Valves (Atmospheric and Dual)
SR 3.6.3.7	Containment Isolation Valves (Atmospheric and Dual)
SR 3.6.3.7 Bases	Containment Isolation Valves (Atmospheric and Dual)
Ref. 3.6.6A Bases	Containment Spray and Cooling Systems (Atmospheric and Dual)
Ref. 3.6.6B Bases	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.6	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.6	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.6 Bases	Containment Spray and Cooling Systems (Atmospheric and Dual) Change Description: Bases applies to 3.6.6B.6 and 3.6.6B.7
SR 3.6.6A.6 Bases	Containment Spray and Cooling Systems (Atmospheric and Dual) Change Description: Bases applies to 3.6.6A.6 and 3.6.6A.7
SR 3.6.6B.7	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.7	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.8	Containment Spray and Cooling Systems (Atmospheric and Dual)

SR 3.6.6A.8	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.8 Bases	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.8 Bases	Containment Spray and Cooling Systems (Atmospheric and Dual)
Ref. 3.6.7 Bases	Spray Additive System (Atmospheric and Dual)
SR 3.6.7.5	Spray Additive System (Atmospheric and Dual)
SR 3.6.7.5 Bases	Spray Additive System (Atmospheric and Dual)
Ref. 3.6.9 Bases	HMS (Atmospheric and Dual)
SR 3.6.9.3	HMS (Atmospheric and Dual)
SR 3.6.9.3 Bases	HMS (Atmospheric and Dual)
Ref. 3.6.10 Bases	ICS (Atmospheric and Dual)
SR 3.6.10.3	ICS (Atmospheric and Dual)
SR 3.6.10.3 Bases	ICS (Atmospheric and Dual)
Ref. 3.6.13 Bases	SBEACS (Dual)
SR 3.6.13.3	SBEACS (Dual)
SR 3.6.13.3 Bases	SBEACS (Dual)
Ref. 3.7.7 Bases	CCW System
SR 3.7.7.2	CCW System
SR 3.7.7.2 Bases	CCW System
SR 3.7.7.3	CCW System
SR 3.7.7.3 Bases	CCW System
Ref. 3.7.8 Bases	SWS
SR 3.7.8.2	SWS
SR 3.7.8.2 Bases	SWS
SR 3.7.8.3	SWS
SR 3.7.8.3 Bases	SWS
Ref. 3.7.10 Bases	ECW
SR 3.7.10.2	ECW

SR 3.7.10.2 Bases	ECW
SR 3.7.13.3	ECCS PREACS
SR 3.7.13.3 Bases	ECCS PREACS
Ref. 3.7.13.3 Bases	ECCS PREACS
SR 3.7.15.3	PREACS
SR 3.7.15.3 Bases	PREACS
Ref. 3.7.15.3 Bases	PREACS
Ref. 3.8.1 Bases	AC Sources - Operating
SR 3.8.1.11	AC Sources - Operating
SR 3.8.1.11 Bases	AC Sources - Operating
SR 3.8.1.12	AC Sources - Operating
SR 3.8.1.12 Bases	AC Sources - Operating
SR 3.8.1.13	AC Sources - Operating
SR 3.8.1.13 Bases	AC Sources - Operating
SR 3.8.1.16	AC Sources - Operating
SR 3.8.1.16 Bases	AC Sources - Operating
SR 3.8.1.18	AC Sources - Operating
SR 3.8.1.18 Bases	AC Sources - Operating
SR 3.8.1.19	AC Sources - Operating
SR 3.8.1.19 Bases	AC Sources - Operating

1.0 Description

This Traveler is a request to amend NUREG 1432, Revision 2, Revised Standard Technical Specifications for Combustion Engineering Plants. The proposed change provides a risk informed alternative to the existing testing Frequency 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 Frequency 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.

The proposed change is based on a study conducted by the Westinghouse Electric Company, LLC (WEC) on behalf of the Combustion Engineering Owners Group (CEOG) in report WCAP- 15830, “Staggered Integrated ESF Testing”, Reference 2. This study has been written to support this change for selected ESF systems; Section 3.3.5.2 [ESFAS Logic and Manual Trip (Analog)], 3.3.6.2 [ESFAS Logic and Manual Trip (Digital)] and 3.8.1 (AC Sources-Operating). The proposed change and the supporting topical report is applicable to all CE plants, when supported by plant specific Probabilistic Risk Assessment (PRA) review and analyses. The remainder of the systems affected by this change will be justified by each licensee and approved by the NRC. This TSTF addresses all systems, whether covered by the topical report or not.

Because not all Combustion Engineering (CE) plants have converted to the standard technical specifications (TS) of NUREG 1432, some TSs do not refer to this surveillance interval as a Frequency as the standard TSs do. For the purpose of this submittal, the use of the term Frequency may be considered equivalent to the Surveillance Requirement intervals of the non-standard TSs.

2.0 Proposed Change

In summary, the proposed change would permit performance of Surveillance Requirements (SR) related to the Engineered Safety Features Systems every refueling interval on a STAGGERED TEST BASIS. These SRs are currently performed every refueling interval.

The following SRs are affected. They are divided into systems supported by the topical report and those the licensee must specifically address in their submittal.

<u>ADDRESSED IN THE TOPICAL REPORT</u>

SR 3.3.5.2 ESFAS Logic and Manual Trip (Analog)
SR 3.3.6.2 ESFAS Logic and Manual Trip (Digital)
SR 3.8.1.11 AC Sources – Operating
SR 3.8.1.12 AC Sources – Operating
SR 3.8.1.16 AC Sources – Operating
SR 3.8.1.18 AC Sources – Operating
SR 3.8.1.19 AC Sources - Operating

<u>ADDRESSED BY LICENSEE</u>

SR 3.5.2.6 ECCS - Operating
SR 3.5.2.7 ECCS - Operating
SR 3.5.2.8 ECCS – Operating
SR 3.6.3.7 Containment Isolation Valves (Atmospheric and Dual)
SR 3.6.6A.6 Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.7 Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.8 Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.6 Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.7 Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.8 Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.7.5 Spray Additive System (Atmospheric and Dual)
SR 3.6.9.3 HMS (Atmospheric and Dual)
SR 3.6.10.3 ICS (Atmospheric and Dual)
SR 3.6.13.3 SBEACS (Dual)
SR 3.7.7.2 CCW System
SR 3.7.7.3 CCW System
SR 3.7.8.2 SWS
SR 3.7.8.3 SWS
SR 3.7.10.2 ECW
SR 3.7.13.3 ECCS PREACS
SR 3.7.15.3 PREACS

The selected SRs are related to the integrated testing of emergency systems with or without a concurrent loss of offsite power. The TSs will be changed to indicate that the SRs may be performed on a [18] month STAGGERED TEST BASIS. This will result in the 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. The TS Bases will also be changed to include a Reviewer's Note stating that the extended Frequencies are applicable to plants adopting CEOG topical report WCAP- 15830, "Staggered Integrated ESF Testing" and/or providing appropriate justification to the NRC.

3.0 Background

This proposed change addresses the systems covered by the integrated ESF test, the ESF logic modules and the diesel generators (covered by the topical report), and other ESF equipment required to respond during integrated ESF testing (addressed by the licensee).

The intent of the proposed amendment is to extend and stagger the performance of the Integrated ESF SRs. The scope and methods used to perform this SR will be unchanged. Reducing the Frequency will increase the likelihood of an undetected equipment failure. The change in plant risk is analyzed and quantified for individual plants using PRA techniques.

First, the analysis will identify the SRs, components, and functions addressed by this test.

Next, each tested component/function will be analyzed to determine if that component/function is tested or proven OPERABLE by other means. If an alternative test or activity proves the component/function OPERABLE, then the component/function will be qualitatively categorized as needing no further risk 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 test interval. The risk associated with the increased test 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 the WEC topical report. 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 RCS mass addition challenges
- Reduce wear and tear on safety equipment
- Reduce challenges to safety equipment
- Reduce potential for personnel injury
- Reduce critical path and operations 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 SR, 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 the 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 Refueling Water Storage Tank (RWST), and exceeding the maximum overpressure in the Volume Control Tank (VCT). 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 to service. Although Combustion Engineering 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 pressures 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 will also reduce the number of potential challenges to containment closure.

In addition, execution of the Integrated ESF SR 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 like 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 (MODE 5 or 6) 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 overpressure 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 doing 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 Reactor Coolant System (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 10 CFR 50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the ESF systems.

ADDRESSED BY THE LICENSEE

Each licensee must address the systems described below as they apply to the specific licensee’s TSs. Not all of these systems are contained in each licensee’s TSs. Licensees must provide specific information about the covered systems and appropriate design basis accidents. Changes to equivalent licensee systems may be made using this format.

SR 3.5.2.6	ECCS - Operating
SR 3.5.2.7	ECCS - Operating
SR 3.5.2.8	ECCS – Operating
SR 3.6.3.7	Containment Isolation Valves (Atmospheric and Dual)
SR 3.6.6A.6	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.7	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6A.8	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.6	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.7	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.6B.8	Containment Spray and Cooling Systems (Atmospheric and Dual)
SR 3.6.7.5	Spray Additive System (Atmospheric and Dual)
SR 3.6.9.3	HMS (Atmospheric and Dual)
SR 3.6.10.3	ICS (Atmospheric and Dual)
SR 3.6.13.3	SBEACS (Dual)
SR 3.7.7.2	CCW System

SR 3.7.7.3 CCW System
SR 3.7.8.2 SWS
SR 3.7.8.3 SWS
SR 3.7.10.2 ECW
SR 3.7.13.3 ECCS PREACS
SR 3.7.15.3 PREACS

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 SR Frequency is acceptable. Changing the SR Frequency requirement to a STAGGERED TEST BASIS is intended to accomplish several things.

4.0 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 SRs 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.

<u>Deterministic Assessment</u>
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 SR 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 SR change does not affect the ability of the ESF systems to prevent core damage as described in the referenced Topical Report. The SR 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 SR may reduce the likelihood of a test-induced transient or accident. This last item is an unquantified benefit of the SR change.

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

  The plant design will not be changed to accommodate the proposed SR 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 SR 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 SR, 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 SR 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 SR change and no new at-power test or maintenance activities are expected to occur as a result of the SR 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.

<u>Probabilistic Assessment</u>

<u>Changes Addressed in the Topical Report</u>

The portion of the proposed change supported by the topical report is related to the SR Frequency 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 a [18] month STAGGERED TEST BASIS. 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 WEC topical report WCAP- 15830, "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 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 1). 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 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 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.

<u>Changes Addressed by the Licensee</u>

Each licensee, using methods equivalent to those described in the topical report, will address the remainder of the components covered by the integrated ESFAS test. The proposed change does not affect any associated Limiting Conditions for Operation (LCO), Applicability or Required Actions. The TS Bases will be changed to indicate that the surveillance may be performed on a [18] month STAGGERED TEST BASIS. This will result in the 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. The TS Bases will also be changed to include a note to the reviewer stating that the applicable portions of the TS Bases are applicable to plants that have completed a plant specific evaluation that has been approved as part of the plant specific submittal.

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". The topical report demonstrates that any change in risk will be negligible if a staggered test frequency is adopted for integrated ESF testing. A report was prepared for plant PSA staff to be used in quantifying the risk. This report 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. These PSA evaluation results will be provided to the NRC Staff as part of a plant specific submittal.

5.0 Regulatory Analysis

5.1 No Significant Hazards Consideration

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change 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 Frequency 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, the TSTF concludes that the proposed change 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.

5.2 Applicable Regulatory Requirements/Criteria

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.

6.0 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.

7.0 References

1. Regulatory Guide 1.174, An approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-specific Changes to the Licensing Basis, July 1998

2. CEOG topical report WCAP- 15830, "Staggered Integrated ESF Testing"

Insert A

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

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.] [The [18] month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.]

Insert B

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

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.] [The [18] month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The [18] month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.]

Insert C

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the containment isolation valves on a given penetration of n x [18] months, where n is the number of trains of a particular function passing through the containment 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.] [The [18] month Frequency was developed considering it is prudent that this SR be performed only during a unit outage, since isolation of penetrations would eliminate cooling water flow and disrupt normal operation of many critical components. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.]

Insert D

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

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.] [The [18] month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience.]

Insert E

– REVIEWER'S NOTE –

The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

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.] [The [18] month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The [18] month Frequency is based on operating experience and design reliability of the equipment.]

Insert F

– REVIEWER'S NOTE –

The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

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.] [The [18] month Frequency is consistent with that specified in Regulatory Guide 1.52 (Ref. [4]).]

Insert G

– REVIEWER'S NOTE –

The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the standby power sources of n x [18] months, where n is the number of onsite Class 1E AC Electrical Power Distribution 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.] [The Frequency of [18] months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. [9]), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.]

Insert H

– REVIEWER'S NOTE –

The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the standby power sources of n x [18] months, where n is the number of onsite Class 1E AC Electrical Power Distribution 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.] [The Frequency of [18] months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency.]

Insert I

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the standby power sources of n x [18] months, where n is the number of onsite Class 1E AC Electrical Power Distribution 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.] [The Frequency of [18] months is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency.]

Insert J

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the standby power sources of n x [18] months, where n is the number of onsite Class 1E AC Electrical Power Distribution 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.] [The Frequency of [18] months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. [9]), paragraph 2.a.(6), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.]

Insert K

– REVIEWER'S NOTE –

The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the standby power sources of n x [18] months, where n is the number of onsite Class 1E AC Electrical Power Distribution 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.] [The Frequency of [18] months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. [9]), paragraph 2.a.(2), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.]

Insert L

– REVIEWER'S NOTE –

The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

The Frequency of [18] months on a STAGGERED TEST BASIS results in the interval between successive tests of the standby power sources of n x [18] months, where n is the number of onsite Class 1E AC Electrical Power Distribution 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.] [The Frequency of [18] months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths.]

Insert M

– REVIEWER'S NOTE –
The STAGGERED TEST BASIS Frequency is only applicable to plants adopting the WEC Topical Report WCAP- 15830, "Staggered Integrated ESF Testing."

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 channels in the Function 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.] [The [18] month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.]

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more Functions with two Manual Trip or Actuation Logic channel inoperable except AFAS. OR Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	------------------------------- - NOTES - ------------------------------- 1. Testing of Actuation Logic shall include verification of the proper operation of each initiation relay. 2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested during the previous 6 months. --- Perform a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel.	[92] days
SR 3.3.5.2	Perform a CHANNEL FUNCTIONAL TEST on each ESFAS Manual Trip channel.	[18] months [on a STAGGERED TEST BASIS]

BASES

SURVEILLANCE REQUIREMENTS (continued)

- Letdown stop valves,
- CCW to and from the RCPs,
- MSIVs and feedwater isolation valves, and
- Instrument air containment isolation valves.

The reasons that each of the above cannot be fully tested at power are stated in Reference 1.

These tests verify that the ESFAS is capable of performing its intended function, from bistable input through the actuated components.

The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 2).

SR 3.3.5.2

A CHANNEL FUNCTIONAL TEST is performed on the manual ESFAS actuation circuitry, de-energizing relays and providing Manual Trip of the Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the Function. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.~~

Insert M →

BASES

REFERENCES

1. FSAR, Section [7.3].

2. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

3. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.3	Perform a CHANNEL FUNCTIONAL TEST on each ESFAS Manual Trip channel.	[18] months [on a STAGGERED TEST BASIS]

BASES

SURVEILLANCE REQUIREMENTS (continued)

exception. Relays not tested at power must be tested in accordance with the Note to this SR.

SR 3.3.6.3

A CHANNEL FUNCTIONAL TEST is performed on the manual ESFAS actuation circuitry, de-energizing relays and providing manual actuation of the function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.~~

Insert M →

REFERENCES

1. FSAR, Section [7.3].

2. CEN-327, May 1986, including Supplement 1, March 1989.

3. CEN-403.

4. [WCAP-15830, date.]

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Less than 100% of the ECCS flow equivalent to a single OPERABLE train available.	D.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	[Verify the following valves are in the listed position with power to the valve operator removed [and key locked in position]. Valve Number / Position / Function [ ] / [ ] / [ ] [ ] / [ ] / [ ] [ ] / [ ] / [ ]	12 hours]
SR 3.5.2.2	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.3	[Verify ECCS piping is full of water.	31 days]
SR 3.5.2.4	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.5	[Verify each charging pump develops a flow of ≥ [36] gpm at a discharge pressure of ≥ [2200] psig.	In accordance with the Inservice Testing Program]
SR 3.5.2.6	Verify each ECCS automatic valve that is not locked, sealed, or otherwise secured in position, in the flow path actuates to the correct position on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.7	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.5.2.8	Verify each LPSI pump stops on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.5.2.9	[Verify, for each ECCS throttle valve listed below, each position stop is in the correct position. Valve Number [ ] [ ]	[18] months]
SR 3.5.2.10	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	[18] months

BASES

SURVEILLANCE REQUIREMENTS (continued)

each ECCS pump starts on receipt of an actual or simulated SIAS, and that the LPSI pumps stop on receipt of an actual or simulated RAS. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.~~ Insert B The actuation logic is tested as part of the Engineered Safety Feature Actuation System (ESFAS) testing, and equipment performance is monitored as part of the Inservice Testing Program.

SR 3.5.2.9

Realignment of valves in the flow path on an SIAS is necessary for proper ECCS performance. The safety injection valves have stops to position them properly so that flow is restricted to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. This SR is not required for units with flow limiting orifices. The 18 month Frequency is based on the same factors as those stated above for SR 3.5.2.6, SR 3.5.2.7, and SR 3.5.2.8.

SR 3.5.2.10

Periodic inspection of the containment sump ensures that it is unrestricted and stays in proper operating condition. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during an outage, on the need to have access to the location, and on the potential for unplanned transients if the Surveillance were performed with the reactor at power. This Frequency is sufficient to detect abnormal degradation and is confirmed by operating experience.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
2. 10 CFR 50.46.
3. FSAR, Chapter [6].
4. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.6	Perform leakage rate testing for containment purge valves with resilient seals.	184 days AND Within 92 days after opening the valve
SR 3.6.3.7	Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.3.8	[Verify each [ ] inch containment purge valve is blocked to restrict the valve from opening > [50]%.	[18] months]
SR 3.6.3.9	[Verify the combined leakage rate for all secondary containment bypass leakage paths is ≤ [L_a] when pressurized to ≥ [psig].	In accordance with the Containment Leakage Rate Testing Program]

BASES

SURVEILLANCE REQUIREMENTS (continued)

(due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 4).

Additionally, this SR must be performed within 92 days after opening the valve. The 92 day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure after a valve has been opened.

SR 3.6.3.7

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures each automatic containment isolation valve will actuate to its isolation position on a containment isolation actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The [18] month Frequency was developed considering it is prudent that this SR be performed only during a unit outage, since isolation of penetrations would eliminate cooling water flow and disrupt normal operation of many critical components. Operating experience has shown that these components usually pass this SR when performed on the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert C

[SR 3.6.3.8

- REVIEWER'S NOTE -
This SR is only required for those units with resilient seal purge valves allowed to be open during [MODE 1, 2, 3, or 4] and having blocking devices on the valves that are not permanently installed.

Verifying that each [42] inch containment purge valve is blocked to restrict opening to ≤ [50]% is required to ensure that the valves can close under DBA conditions within the times assumed in the analyses of References 1 and 2. If a LOCA occurs, the purge valves must close to maintain containment leakage within the values assumed in the accident analysis. At other times when purge valves are required to be capable of closing (e.g., during movement of [recently] irradiated fuel assemblies), pressurization concerns are not present, thus the purge valves can be

BASES

SURVEILLANCE REQUIREMENTS (continued)

fully open. The [18] month Frequency is appropriate because the blocking devices are typically removed only during a refueling outage.]

[SR 3.6.3.9

This SR ensures that the combined leakage rate of all secondary containment bypass leakage paths is less than or equal to the specified leakage rate. This provides assurance that the assumptions in the safety analysis are met. The leakage rate of each bypass leakage path is assumed to be the maximum pathway leakage (leakage through the worse of the two isolation valves) unless the penetration is isolated by use of one closed and de-activated automatic valve, closed manual valve, or blind flange. In this case, the leakage rate of the isolated bypass leakage path is assumed to be the actual pathway leakage through the isolation device. If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. The Frequency is required by the Containment Leakage Rate Testing Program. This SR simply imposes additional acceptance criteria.

[Bypass leakage is considered part of L_a.

- REVIEWER'S NOTE -

Unless specifically exempted.]]

REFERENCES

1. FSAR, Section [ ].
2. FSAR, Section [ ].
3. Standard Review Plan 6.2.4.
4. Generic Issue B-20.
5. Generic Issue B-24.
6. 10 CFR 50, Appendix J, Option [A][B].
7. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6A.6	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[18] months [ON A STAGGERED TEST BASIS]
SR 3.6.6A.7	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	[18] months
SR 3.6.6A.8	Verify each containment cooling train starts automatically on an actual or simulated actuation signal.	[18] months
SR 3.6.6A.9	Verify each spray nozzle is unobstructed.	[At first refueling] <u>AND</u> 10 years

BASES

SURVEILLANCE REQUIREMENTS (continued)

[SR 3.6.6A.4

Verifying that the containment spray header piping is full of water to the [100] ft level minimizes the time required to fill the header. This ensures that spray flow will be admitted to the containment atmosphere within the time frame assumed in the containment analysis. The 31 day Frequency is based on the static nature of the fill header and the low probability of a significant degradation of water level in the piping occurring between surveillances.]

SR 3.6.6A.5

Verifing that each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 6). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.6A.6 and SR 3.6.6A.7

These SRs verify that each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The [18] month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the [18] month Frequency.~~ Insert A Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

The surveillance of containment sump isolation valves is also required by SR 3.5.2.5. A single surveillance may be used to satisfy both requirements.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6A.8

This SR verifies that each containment cooling train actuates upon receipt of an actual or simulated actuation signal. ~~The [18] month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience.~~ Insert D See SR 3.6.6A.6 and SR 3.6.6A.7, above, for further discussion of the basis for the [18] month Frequency.

SR 3.6.6A.9

With the containment spray inlet valves closed and the spray header drained of any solution, low pressure air or smoke can be blown through test connections. Performance of this SR demonstrates that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test at [the first refueling and at] 10 year intervals is considered adequate to detect obstruction of the spray nozzles.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 38, GDC 39, GDC 40, GDC 41, GDC 42, and GDC 43.
2. FSAR, Section [ ].
3. FSAR, Section [ ].
4. FSAR, Section [ ].
5. FSAR, Section [ ].
6. ASME, Boiler and Pressure Vessel Code, Section XI.
7. [WCAP 15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6B.6	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to its correct position on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.6B.7	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.6B.8	Verify each containment cooling train starts automatically on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.6B.9	Verify each spray nozzle is unobstructed.	[At first refueling] AND 10 years

BASES

SURVEILLANCE REQUIREMENTS (continued)

performance required by Section XI of the ASME Code (Ref. 6). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.6B.6 and SR 3.6.6B.7

These SRs verify each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The [18] month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the [18] month Frequency.~~ Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Insert A

The surveillance of containment sump isolation valves is also required by SR 3.5.2.5. A single surveillance may be used to satisfy both requirements.

SR 3.6.6B.8

This SR verifies each containment cooling train actuates upon receipt of an actual or simulated actuation signal. ~~The [18] month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience.~~ See SR 3.6.6B.6 and SR 3.6.6B.7, above, for further discussion of the basis for the [18] month Frequency.

Insert D

SR 3.6.6B.9

With the containment spray inlet valves closed and the spray header drained of any solution, low pressure air or smoke can be blown through test connections. Performance of this SR demonstrates that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive

BASES

SURVEILLANCE REQUIREMENTS (continued)

design of the nozzle, a test at [the first refueling and at] 10 year intervals is considered adequate to detect obstruction of the spray nozzles.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 38, GDC 39, GDC 40, GDC 41, GDC 42, and GDC 43.
2. FSAR, Section [ ].
3. FSAR, Sections [ ].
4. FSAR, Section [ ].
5. FSAR, Section [ ].
6. ASME, Boiler and Pressure Vessel Code, Section XI.
7. [WCAP 15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.7.4	[Verify each spray additive pump develops a differential pressure of [100] psid on recirculation flow.	In accordance with the Inservice Testing Program]
SR 3.6.7.5	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.7.6	[Verify spray additive flow [rate] from each solution's flow path.	5 years]

BASES

SURVEILLANCE REQUIREMENTS (continued)

performed to verify the availability of sufficient hydrazine (N_2H_4) solution in the Spray Additive System. The 184 day Frequency is based on the low probability of an undetected change in tank volume occurring during the SR interval (the tank is isolated during normal unit operations). Tank level is also indicated and alarmed in the control room, such that there is a high confidence that a substantial change in level would be detected.

SR 3.6.7.3

This SR provides verification of the N_2H_4 concentration in the spray additive tank and is sufficient to ensure that the spray solution being injected into containment is at the correct pH level. The concentration of N_2H_4 in the spray additive tank must be determined by chemical analysis. The 184 day Frequency is sufficient to ensure that the concentration level of N_2H_4 in the spray additive tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.

[SR 3.6.7.4

The chemical addition pump must be verified to provide the flow rate assumed in the accident analysis to the Containment Spray System. The Spray Additive System is not operated during normal operations. This prevents periodically subjecting systems, structures, and components within containment to a caustic spray solution. Therefore, this test must be performed on recirculation with the discharge flow path from each spray chemical addition pump aligned back to the spray additive tank. The differential pressure obtained by the pump on recirculation is analogous to the full spray additive flow provided to the Containment Spray System on an actual CSAS. The Frequency of this SR is in accordance with the Inservice Testing Program and is sufficient to identify component degradation that may affect flow rate.]

SR 3.6.7.5

This SR verifies that each automatic valve in the Spray Additive System flow path actuates to its correct position on a CSAS. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at~~

Insert A

BASES

SURVEILLANCE REQUIREMENTS (continued)

power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

[SR 3.6.7.6

To ensure that the correct pH level is established in the borated water solution provided by the Containment Spray System, the flow rate in the Spray Additive System is verified once per 5 years. This SR provides assurance that the correct amount of N_2H_4 will be metered into the flow path upon Containment Spray System initiation. Due to the passive nature of the spray additive flow controls, the 5 year Frequency is sufficient to identify component degradation that may affect flow rate.]

REFERENCES

1. FSAR, Section [ ].
2. [WCAP 15830, date.]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.9.1	Operate each HMS train for ≥ 15 minutes.	92 days
SR 3.6.9.2	Verify each HMS train flow rate on slow speed is ≥ [37,000] cfm.	[18] months
SR 3.6.9.3	Verify each HMS train starts on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]

BASES

SURVEILLANCE REQUIREMENTS (continued)

the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.9.3

This SR ensures that the HMS responds properly to a CCAS. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Insert A

REFERENCES

1. 10 CFR 50.44.
2. 10 CFR 50, Appendix A, GDC 41.
3. Regulatory Guide 1.7, Revision [1].
4. [WCAP 15830, date.]

3.6 CONTAINMENT SYSTEMS

3.6.10 Iodine Cleanup System (ICS) (Atmospheric and Dual)

LCO 3.6.10 [Two] ICS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ICS train inoperable.	A.1 Restore ICS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.10.1	Operate each ICS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.6.10.2	Perform required ICS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.10.3	Verify each ICS train actuates on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.10.4	[Verify each ICS filter bypass damper can be opened.	[18] months]

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.10.2

This SR verifies that the required ICS filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.10.3

The automatic startup test verifies that both trains of equipment start upon receipt of an actual or simulated test signal. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Insert A Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. Furthermore, the Frequency was developed considering that the system equipment OPERABILITY is demonstrated on a 31 day Frequency by SR 3.6.10.1.

[SR 3.6.10.4

The ICS filter bypass dampers are tested to verify OPERABILITY. The dampers are in the bypass position during normal operation and must reposition for accident operation to draw air through the filters. The [18] month Frequency is considered to be acceptable based on the damper reliability and design, the mild environmental conditions in the vicinity of the dampers, and the fact that operating experience has shown that the dampers usually pass the Surveillance when performed at the [18] month Frequency.]

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41, GDC 42, and GDC 43.
2. FSAR, Section [ ].
3. Regulatory Guide 1.52, Revision [2].
4. FSAR, Section [ ].
5. [WCAP-15830, date.]

3.6 CONTAINMENT SYSTEMS

3.6.13 Shield Building Exhaust Air Cleanup System (SBEACS) (Dual)

LCO 3.6.13 Two SBEACS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SBEACS train inoperable.	A.1 Restore train to OPERABLE status.	7 days
B. Required Action and Associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.13.1	Operate each SBEACS train for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.6.13.2	Perform required SBEACS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.13.3	Verify each SBEACS train actuates on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.6.13.4	[Verify each SBEACS filter bypass damper can be opened.	[18] months]

BASES

SURVEILLANCE REQUIREMENTS (continued)

was developed considering the known reliability of fan motors and controls, the two train redundancy available, and the iodine removal capability of the Containment Spray System.

SR 3.6.13.2

This SR verifies that the required SBEACS filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing of HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the *activated charcoal* (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.13.3

The automatic startup ensures that each SBEACS train responds properly. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. Furthermore, the SR interval was developed considering that the SBEACS equipment OPERABILITY is demonstrated at a 31 day Frequency by SR 3.6.13.1.

Insert A →

[SR 3.6.13.4

The filter bypass dampers are tested to verify OPERABILITY. The dampers are in the bypass position during normal operation and must reposition for accident operation to draw air through the filters. The [18] month Frequency is considered to be acceptable based on the damper reliability and design, the mild environmental conditions in the vicinity of the dampers, and the fact that operating experience has shown that the dampers usually pass the Surveillance when performed at the [18] month Frequency.]

SR 3.6.13.5

The SBEACS train flow rate is verified ≥ [ ] cfm to ensure that the flow rate is adequate to "pull down" the shield building pressure as required. This test also will verify the proper functioning of the fans, dampers,

BASES

SURVEILLANCE REQUIREMENTS (continued)

filters, absorbers, etc., when this SR is performed in conjunction with SR 3.6.11.4.

The [18] month on a STAGGERED TEST BASIS Frequency is consistent with the Regulatory Guide 1.52 (Ref. 4) guidance.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. FSAR, Section [ ].
3. FSAR, Section [ ].
4. Regulatory Guide 1.52, Revision [2].
5. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	- NOTE - Isolation of CCW flow to individual components does not render the CCW System inoperable. Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.7.2

This SR verifies proper automatic operation of the CCW valves on an actual or simulated actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Therefore, the Frequency is acceptable from a reliability standpoint.

Insert A

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [9.2.2].

2. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	- NOTE - Isolation of SWS flow to individual components does not render the SWS inoperable. Verify each SWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.8.2	Verify each SWS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]
SR 3.7.8.3	Verify each SWS pump starts automatically on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]

BASES

ACTIONS (continued)

by the OPERABLE train, and the low probability of a DBA occurring during this time period.

B.1 and B.2

If the SWS train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the SWS flow path ensures that the proper flow paths exist for SWS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR is modified by a Note indicating that the isolation of the SWS components or systems may render those components inoperable but does not affect the OPERABILITY of the SWS.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the SWS valves on an actual or simulated actuation signal. The SWS is a normally operating system that cannot be fully actuated as part of the normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed~~

Insert A

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.8.3

The SR verifies proper automatic operation of the SWS pumps on an actual or simulated actuation signal. The SWS is a normally operating system that cannot be fully actuated as part of the normal testing during normal operation. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ Therefore, the Frequency is acceptable from a reliability standpoint.

Insert A

REFERENCES

1. FSAR, Section [9.2.1].
2. FSAR, Section [6.2].
3. FSAR, Section [5.4.7].
4. [WCAP-15830, date.]

3.7 PLANT SYSTEMS

3.7.10 Essential Chilled Water (ECW)

LCO 3.7.10 [Two] ECW trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECW train inoperable.	A.1 Restore ECW train to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.10.1	- NOTE - Isolation of ECW flow to individual components does not render the ECW system inoperable. Verify each ECW manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.10.2	Verify the proper actuation of each ECW System component on an actual or simulated actuation signal.	[18] months [on a STAGGERED TEST BASIS]

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Verifying the correct alignment for manual, power operated, and automatic valves in the ECW flow path provides assurance that the proper flow paths exist for ECW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

This SR is modified by a NOTE indicating that the isolation of ECW flow to components or systems may render those components inoperable but does not affect the OPERABILITY of the ECW system.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.10.2

This SR verifies proper automatic operation of the ECW System components that the ECW pumps will start in the event of any accident or transient that generates an SIAS. This SR also ensures that each automatic valve in the flow paths actuates to its correct position on an actual or simulated SIAS. The ECW System cannot be fully actuated as part of the SIAS CHANNEL FUNCTIONAL TEST during normal operation. The actuation logic is tested as part of the SIAS functional test every 92 days, except for the subgroup relays that actuate the system that cannot be tested during normal unit operation. ~~The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The [18] month Frequency is based on operating experience and design reliability of the equipment.~~

Insert E

REFERENCES

1. FSAR, Section [9.2.9].
2. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each ECCS PREACS train for [≥ 10 continuous hours with the heater operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.7.13.2	Perform required ECCS PREACS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with the [VFTP]
SR 3.7.13.3	Verify each ECCS PREACS train actuates on an actual or simulated actuation signal.	[18] months ON A STAGGERED TEST BASIS
SR 3.7.13.4	Verify one ECCS PREACS train can maintain a negative pressure ≥ [ ] inches water gauge relative to atmospheric pressure during the [post accident] mode of operation at a flow rate of ≤ [20,000] cfm.	[18] months on a STAGGERED TEST BASIS
SR 3.7.13.5	[Verify each ECCS PREACS filter bypass damper can be opened.	[18] months]

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.2

This SR verifies that the required ECCS PREACS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The [VFTP] includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the [VFTP].

SR 3.7.13.3

This SR verifies that each ECCS PREACS train starts and operates on an actual or simulated actuation signal. ~~The [18] month Frequency is consistent with that specified in Regulatory Guide 1.52 (Ref. 4).~~

Insert F

SR 3.7.13.4

This SR verifies the integrity of the ECCS pump room enclosure. The ability of the ECCS pump room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper function of the ECCS PREACS. During the post accident mode of operation, the ECCS PREACS is designed to maintain a slight negative pressure in the ECCS pump room with respect to adjacent areas to prevent unfiltered LEAKAGE. The ECCS PREACS is designed to maintain this negative pressure at a flow rate of ≤ [20,000] cfm from the ECCS pump room. The Frequency of [18] *months is consistent with the guidance provided in the* NUREG-0800, Section 6.5.1 (Ref. 6).

This test is conducted with the tests for filter penetration; thus, an [18] month Frequency, on a STAGGERED TEST BASIS is consistent with other filtration SRs.

[SR 3.7.13.5

Operating the ECCS PREACS filter bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the bypass damper is verified if it can be closed. An [18] month Frequency is consistent with that specified in Reference 4.]

BASES

REFERENCES

1. FSAR, Section [6.5.1].
2. FSAR, Section [9.4.5].
3. FSAR, Section [15.6.5].
4. Regulatory Guide 1.52, Rev. [2].
5. 10 CFR 100.11.
6. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.
7. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.15.2	Verify required PREACS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with the [VFTP]
SR 3.7.15.3	[Verify each PREACS train actuates on an actual or simulated actuation signal.	[18] months] [on a STAGGERED TEST BASIS]
SR 3.7.15.4	[Verify one PREACS train can maintain a negative pressure ≥ [ ] inches water gauge with respect to atmospheric pressure during the [post accident] mode of operation at a flow rate of ≤ [3000] cfm.	[18] months on a STAGGERED TEST BASIS]
SR 3.7.15.5	[Verify each PREACS filter bypass damper can be opened.	[18] months]

BASES

SURVEILLANCE REQUIREMENTS (continued)

[SR 3.7.15.3

This SR verifies that each PREACS train starts and operates on an actual or simulated actuation signal. ~~The [18] month Frequency is consistent with that specified in Reference 4.~~]

Insert F

[SR 3.7.15.4

This SR verifies the integrity of the penetration room enclosure. The ability of the penetration room to maintain negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper function of the PREACS. During the post accident mode of operation, PREACS is designed to maintain a slightly negative pressure at a flow rate of ≤ [3000] cfm in the penetration room with respect to adjacent areas to prevent unfiltered LEAKAGE. The Frequency of [18] months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 6).]

[The minimum system flow rate maintains a slight negative pressure in the penetration room area and provides sufficient air velocity to transport particulate contaminants, assuming only one filter train is operating.

The number of filter elements is selected to limit the flow rate through any individual element to about [1000] cfm. This may vary based on filter housing geometry. The maximum limit ensures that flow through, and pressure drop across, each filter element is not excessive.

The number and depth of the adsorber elements ensures that, at the maximum flow rate, the residence time of the air stream in the charcoal bed achieves the desired adsorption rate. At least a [0.125] second residence time is necessary for an assumed [99]% efficiency.

The filters have a certain pressure drop at the design flow rate when clean. The magnitude of the pressure drop indicates acceptable performance, and is based on manufacturer's recommendations for the filter and adsorber elements at the design flow rate. An increase in pressure drop or decrease in flow indicates that the filter is being loaded or is indicative of other problems with the system.

This test is conducted with the tests for filter penetration; thus, an [18] month Frequency on a STAGGERED TEST BASIS consistent with other filtration SRs.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

[SR 3.7.15.5

Operating the PREACS filter bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the PREACS filter bypass damper is verified if it can be closed. An [18] month Frequency is consistent with that specified in Reference 4.]

REFERENCES

1. FSAR, Section [6.5.1].
2. FSAR, Section [9.4.5].
3. FSAR, Section [15.6.5].
4. Regulatory Guide 1.52 Rev. [2].
5. 10 CFR 100.11.
6. NUREG-0800, Section 6.5.1.
7. [WCAP-15830, date.]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	- NOTES - 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, c. DG auto-starts from standby condition and: 1. Energizes permanently connected loads in ≤ [10] seconds, 2. Energizes auto-connected shutdown loads through [automatic load sequencer], 3. Maintains steady state voltage ≥ [3740] V and ≤ [4580] V, 4. Maintains steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and 5. Supplies permanently connected [and auto-connected] shutdown loads for ≥ 5 minutes.	[18] months [on a STAGGERED TEST BASIS]

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.12	- NOTES - 1. [All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.	
	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In ≤ [10] seconds after auto-start and during tests, achieves voltage ≥ [3740] V and frequency ≥ [58.8] Hz, b. Achieves steady state voltage ≥ [3740] V and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz, c. Operates for ≥ 5 minutes, d. Permanently connected loads remain energized from the offsite power system, and e. Emergency loads are energized [or auto-connected through the automatic load sequencer] from the offsite power system.	[18] months] [On a STAGGERED TEST BASIS]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	- NOTE - [This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.] Verify each DG automatic trip is bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with] an actual or simulated ESF actuation signal except: a. Engine overspeed, b. Generator differential current, [c. Low lube oil pressure, d. High crankcase pressure, and e. Start failure relay.]	[18] months [on a STAGGERED TEST BASIS]

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.15	**- NOTES -** 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ [2] hours loaded ≥ [4500] kW and ≤ [5000] kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. Verify each DG starts and achieves: a. In ≤ [10] seconds, voltage ≥ [3740] V and frequency ≥ [58.8] Hz and b. Steady state voltage ≥ [3740] V and ≤ [4580] V, and frequency ≥ [58.8] Hz and ≤ [61.2] Hz.	[18] months
SR 3.8.1.16	**- NOTE -** This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power, b. Transfers loads to offsite power source, and c. Returns to ready-to-load operation.	[18] months [on a STAGGERED TEST BASIS]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.17	-- **- NOTE -** [This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. -- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: a. Returning DG to ready-to-load operation and [b. Automatically energizing the emergency load from offsite power.]	[18] months]
SR 3.8.1.18	-- **- NOTE -** [This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.] -- Verify interval between each sequenced load block is within ± [10% of design interval] for each emergency [and shutdown] load sequencer.	[18] months [ON A STAGGERED TEST BASIS]

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.19	**- NOTES -** 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ [10] seconds, 2. energizes auto-connected emergency loads through [load sequencer], 3. achieves steady state voltage ≥ [3740] V and ≤ [4580] V, 4. achieves steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and 5. supplies permanently connected [and auto-connected] emergency loads for ≥ [5] minutes.	[18] months [on a STAGGERED TEST BASIS]

BASES

SURVEILLANCE REQUIREMENTS (continued)

c. Performance of the SR or failure of the SR will not cause or result in an AOO with attendant challenge to plant safety systems.

SR 3.8.1.11

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG auto-start time of [10] seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, high pressure injection systems are not capable of being operated at full flow, or shutdown cooling (SDC) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert G → ~~The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine

BASES

SURVEILLANCE REQUIREMENTS (continued)

capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert H

~~The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency.~~ Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients *associated with a failed partial Surveillance, a successful partial* Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.]

SR 3.8.1.13

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, and critical protective functions (engine overspeed, generator differential current, [low lube oil

BASES

SURVEILLANCE REQUIREMENTS (continued)

pressure, high crankcase pressure, and start failure relay]) trip the DG to avert substantial damage to the DG unit. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

Insert I

~~The [18 month] Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency.~~ Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

The SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DG from service. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

- REVIEWER'S NOTE -

The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

BASES

SURVEILLANCE REQUIREMENTS (continued)

manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and that the DG can be returned to ready to load status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive and autoclose signal on bus undervoltage, and the load sequence timers are reset.

Insert J

~~The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), and takes into consideration unit conditions required to perform the Surveillance.~~

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

BASES

SURVEILLANCE REQUIREMENTS (continued)

the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.]

SR 3.8.1.18

Under accident [and loss of offsite power] conditions loads are sequentially connected to the bus by the [automatic load sequencer]. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The [10]% load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 1 provides a summary of the automatic loading of ESF buses.

Insert K

~~The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(2), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.~~

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

BASES

SURVEILLANCE REQUIREMENTS (continued)

- REVIEWER'S NOTE -

The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR or failure of the SR will not cause or result in an AOO with attendant challenge to plant safety systems.

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

Insert L

~~The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of [18 months].~~

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and

BASES

SURVEILLANCE REQUIREMENTS (continued)

challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9).

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated, and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter [8].
3. Regulatory Guide 1.9, Rev. [3].
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. [WCAP-15830, date.]