Duke Energy®

T. PRESTON GILLESPIE, JR.
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP / 7800 Rochester Hwy.
Seneca, SC 29672

864-873-4478
864-873-4208 fax
T.Gillespie@duke-energy.com

June 23, 2011

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Technical Specification Bases (TSB) Changes

Pursuant to Technical Specification 5.5.15, Technical Specifications (TS) Bases Control Program, please find attached the latest changes to the Oconee Technical Specification Bases.

On September 22, 2010 and May 20, 2011, Station Management approved revisions to TSB 3.3.14, Emergency Feedwater (EFW) Pump Initiation Circuitry, to provide additional information regarding the EFW loss of main feedwater (LOMF) circuitry. Specifically, the changes provide clarification regarding what equipment constitutes a channel and a circuit. Also, they provide information regarding the operation of the LOMF circuitry when the main feedwater (MFW) pump turbine is reset.

On April 7, 2011, Station Management approved revisions to TSB 3.8.2, AC Sources – Shutdown, to state that the Keowee Hydro Unit must be capable of starting and accelerating to rated speed and voltage within 23 seconds after a manual emergency start initiation signal. The existing TSB contains an error in the documented time that power has to be connected to the Main Feeder Bus (MFB) from an Operable KHU.

Attachment 1 contains the new TSB pages, Attachment 2 contains the marked up version of the TSB pages.

If any additional information is needed, please contact Kent Alter at 864-873-3255.

Sincerely,

T Gillespie

T. Preston Gillespie, Jr.
Vice President
Oconee Nuclear Station

A001
NRR

cc: John Stang
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 0-8 G9A
Washington, DC 20555

Victor McCree
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Ga. 30303-1257

Andy Sabisch
Senior Resident Inspector
Oconee Nuclear Station

Susan E. Jenkins, Manager
Radioactive & Infectious Waste Management
SC Dept. of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201

Attachment 1

TSB revision

B 3.3 INSTRUMENTATION

B 3.3.14 Emergency Feedwater (EFW) Pump Initiation Circuitry

BASES

BACKGROUND

EFW pump initiation circuitry is designed to provide safety grade means of controlling the secondary system as a heat sink for core decay heat removal. To ensure the secondary system remains a heat sink, the EFW pump initiation circuitry takes action to initiate EFW when the primary source of feedwater is lost. These actions ensure that a source of cooling water is available to be supplied to a steam generator (SG), thereby establishing the heat sink temperature at the saturation temperature of the secondary system.

EFW is initiated to restore a source of cooling water to the secondary system when conditions indicate that the normal source of feedwater is not available. Loss of both main feedwater (MFW) pumps was chosen as an EFW automatic initiating parameter because it is a direct and immediate indicator of loss of MFW.

Each EFW pump has two loss of main feedwater (LOMF) pump instrumentation channels. Each EFW pump LOMF pump instrumentation channel consists of a pressure switch monitoring a MFW pump turbine hydraulic oil pressure header. There are separate pressure switches for each EFW pump and each LOMF instrumentation channel, three monitoring MFW pump turbine "A" hydraulic oil pressure and three monitoring MFW pump turbine "B" hydraulic oil pressure.

Each EFW pump has an automatic initiation circuit. An EFW pump automatic initiation circuit consists of two LOMF instrumentation channels and the subsequent relays and switches that provide the logic ties to the EFW pump start contactor / solenoid. An EFW pump initiation signal is generated when loss of both MFW pumps, indicated by low hydraulic oil pressure on both headers, satisfies the two-out-of-two logic to automatically initiate the EFW pump.

Each EFW pump also has a dedicated manual initiation circuit. A manual initiation circuit consists of those relays and switches that provide logic ties to the EFW pump start contactor / solenoid.

Resetting a MFW pump provides normal hydraulic oil pressure to the LOMF instrumentation channel pressure switches associated with that pump. The LOMF instrumentation channel would then provide a signal of not tripped to the EFW pump initiation circuits even though the MFW pump is not providing feedwater to the steam generators. Therefore,

BASES

BACKGROUND (continued)

administrative controls are in place to trip the LOMF instrumentation channels for a MFW pump prior to resetting the pump. Placing an LOMF channel in trip consists of isolating the LOMF instrument channel pressure switches such that they no longer provide a reset signal.

EFW is also initiated by a low level in the SG (after a 30 second delay to prevent spurious actuation) for SG dryout protection. EFW initiation for SG dryout protection is not required by this Specification. Finally, EFW is also initiated by a loss of both MFW pumps as indicated by low hydraulic oil pressure as part of the ATWS Mitigation Circuitry (AMSAC), which is a system provided to comply with the requirements to reduce risk from an anticipated transient without scram (ATWS). EFW initiation for ATWS mitigation is not required by this Specification.

Each motor driven EFW pump is normally controlled by a four-position, OFF-AUTO1-AUTO2-RUN, control switch located in the control room. The pump can be manually started by turning the control switch to the RUN position. In the AUTO1 mode, each motor-driven EFW pump starts automatically after a sustained low water level in either steam generator for greater than 30 seconds. In the AUTO2 Mode, each pump starts automatically on loss of both MFW pumps (or on low steam generator level or ATWS initiation).

The turbine-driven EFW pump is started by opening valve MS-93 which admits steam to the pump turbine. A four-position, RUN-AUTO-OFF-PULL TO LOCK, control switch is provided to control operation of MS-93. The switch is maintained in the AUTO position. In the AUTO mode, MS-93 opens on loss of both MFW pumps (or ATWS initiation). When the switch is in the RUN position, MS-93 is opened.

APPLICABLE SAFETY ANALYSES

The transient which forms the basis for initiation of the EFW systems is a loss of MFW transient. In the analysis of the transient, MFW pump turbine low hydraulic oil pressure is the parameter assumed to automatically initiate EFW.

The EFW pump initiation circuitry satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

LCO

Two loss of main feedwater (LOMF) pump instrumentation channels, an automatic initiation circuit, and a manual initiation circuit are required OPERABLE for each EFW pump. The LCO is modified by a Note that limits the OPERABILITY required for the automatic initiation circuitry to MODES 1 and 2.

BASES

APPLICABILITY

The initiation circuitry for EFW pumps shall be OPERABLE in MODES 1, 2 and 3 and in MODE 4 when the steam generator is relied upon for heat removal. In MODE 4 when the steam generator is not relied upon for heat removal, and MODES 5, and 6, the primary system temperatures are too low to allow the SGs to effectively remove energy and EFW Pump initiation instrumentation is not required to be OPERABLE.

ACTIONS

The ACTIONS are modified by a Note indicating that this Specification may be entered independently for each EFW pump initiation circuit. The Completion Time(s) of the inoperable channels for each EFW automatic initiation circuit are tracked separately for each circuit starting from the time the Condition is entered for that circuit.

A.1

With one or more required EFW pump initiation circuits with one LOMF channel inoperable, the channel(s) must be placed in trip within 1 hour. With the channel in trip, the resultant logic is one-out-of-one. This channel may be considered placed in trip, after tripping, by installing jumpers or by other means that assure the channel remains in the tripped condition.

B.1

With one or more EFW pump initiation circuits inoperable or the Required Action and associated Completion Time of Condition A not met, the affected EFW pump(s) must be declared inoperable immediately since the initiation function is no longer capable of performing its safety function.

SURVEILLANCE REQUIREMENTS

SR 3.3.14.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure the LOMF pump instrumentation channels can perform their intended function.

The Frequency of 31 days is based on operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given function in any 31 day interval is a rare event.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.14.2

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the manual initiation circuit. This test verifies that the initiating circuitry is OPERABLE and will actuate the emergency feedwater pumps by either starting a motor driven emergency feedwater pump or opening the steam isolation valve that isolates the supply of steam to the drive for the turbine driven emergency feedwater pump.

SR 3.3.14.3

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the automatic initiation circuit. This test verifies that the two-out-of-two logic circuit is functional. This test simulates the required inputs to the logic circuit and verifies successful operation of the automatic initiation circuit. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function, while the risks of testing during operation are avoided.

SR 3.3.14.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Frequency is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Chapters 7 and 15.
2. 10 CFR 50.36.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources – Shutdown

BASES

BACKGROUND

A description of the AC sources, except AC sources utilizing transformer CT-5, is provided in the Bases for LCO 3.8.1, "AC Sources – Operating." An additional source of AC power is available either directly from the 100 kV Central Tie Substation or from the combustion turbines at Lee Steam Station via a 100 kV transmission line connected to Transformer CT-5. This single 100 kV circuit is connected to the 100 kV transmission system through the substation at Central, located eight miles from Oconee. The Central Substation is connected to Lee Steam Station twenty-two miles away through a similar 100 kV line. This line can either be isolated from the balance of the transmission system to supply emergency power to Oconee from Lee Steam Station, or offsite power can be supplied directly from the 100 kV system from the Central Tie Substation. When CT-5 is energized from the 100 kV system, this is an acceptable offsite source for Oconee Units in MODES 5 and 6. When CT-5 is energized from an OPERABLE Lee Combustion Turbine (LCT) and isolated from the balance of the transmission system, this source is an acceptable emergency power source.

Located at Lee Steam Station are two 41 MW combustion turbines. One of these two combustion turbines can be started in one hour and connected to the 100 kV line. Transformer CT-5 is sized to carry the engineered safeguards auxiliaries of one unit plus the shutdown loads of the other two units.

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of recently irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident involving handling recently irradiated fuel. Due to radioactive decay, AC electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel

BASES

APPLICABLE SAFETY ANALYSES (continued)

(i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours).

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many accidents that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst-case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from accident analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4 various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown MODES based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration;

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both;

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems; and

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

BASES

APPLICABLE SAFETY ANALYSES (continued)

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite emergency power sources and their associated emergency power paths.

The AC sources satisfy Criterion 3 of the 10 CFR 50.36 (Ref. 1).

LCO

One offsite source capable of supplying the onsite power distribution system(s) of LCO 3.8.9, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE emergency power source, associated with a distribution system required to be OPERABLE by LCO 3.8.9, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite source. Together, OPERABILITY of the required offsite source and emergency power source ensure the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents involving handling recently irradiated fuel).

The qualified offsite source must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the main feeder bus(es). Qualified offsite source are those that are described in the UFSAR and are part of the licensing basis for the unit.

An offsite source can be an offsite circuit available or connected through to the 230 kV switchyard to the startup transformer and to one main feeder bus. Additionally, the offsite source can be an offsite circuit available or connected though the 230 kV switchyard (525 kV switchyard for Unit 3) to a backcharged unit main step-up transformer and unit auxiliary transformer to one main feeder bus. Another alternative is the energized Central 100 kV switchyard available or connected through the 100 kV line and transformer CT-5 to one main feeder bus.

In MODES 5 or 6 and during movement of irradiated fuel, a Lee Combustion Turbine (LCT) energizing one standby bus via an isolated power path to one main feeder bus can be utilized as an emergency power source. The LCT is required to provide power within limits of voltage and frequency using the 100 kV transmission line electrically separated from the system grid and offsite loads energizing one or more standby buses through transformer CT-5. The required number of energized standby buses is based upon the requirements of LCO 3.8.9, "Distribution System – Shutdown."

BASES

LCO (continued)

An OPERABLE KHU must be capable of starting and accelerating to rated speed and voltage within 23 seconds after a manual emergency start initiation signal. The Unit must then be capable of connecting to the main feeder bus(es). An emergency power source must be capable of accepting required loads and must continue to operate until offsite power can be restored to the main feeder buses.

This LCO is modified by three Notes. Note 1 indicates that a unit startup transformer may be shared with a unit in MODES 5 and 6. Note 2 indicates that the requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used for the emergency power requirements. Note 3 indicates that the required emergency power source and the required offsite power source shall not be susceptible to a failure disabling both sources.

The required emergency power source and required offsite source cannot be susceptible to a failure disabling both sources. If the required offsite source is the 230 kV switchyard and the startup transformer energizing the required main feeder bus(es), the KHU and its required underground emergency power path are required to be OPERABLE since it is not subject to a failure, such as an inoperable startup transformer, which simultaneously disables the offsite source. If the Central switchyard is serving as the required offsite source through the CT-5 transformer with a power path through only one standby bus, the KHU and its required underground emergency power path cannot be used as the emergency power source if the power path is through the same standby bus since a single failure of a standby bus would disable both sources. Conversely, if an LCT is being used as an emergency power source, the required offsite source must be an offsite circuit available or connected through the startup transformer or a backcharged unit main step-up transformer and the unit auxiliary transformer.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of recently irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours) are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

BASES

APPLICABILITY (continued)

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

A.1

An offsite source would be considered inoperable if it were not available to one required main feeder bus. Although two main feeder buses may be required by LCO 3.8.9, the one main feeder bus with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and recently irradiated fuel movement. By the allowance of the option to declare features inoperable with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4

With the offsite source not available to all required features, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required emergency power source inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, movement of recently irradiated fuel assemblies, and operations involving positive reactivity additions. The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the required SDM is maintained.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

BASES

ACTIONS

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4 (continued)

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required main feeder bus, the ACTIONS for LCO 3.8.9 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite source, whether or not a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for the situation involving a de-energized required main feeder bus.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.7, SR 3.8.1.13, SR 3.8.1.14, SR 3.8.1.15 and SR 3.8.1.16 are not required to be met. SR 3.8.1.7 verifies both KHUs cannot be tied to the underground emergency power path simultaneously. This SR verifies train independence to prevent a single failure from disabling both KHUs. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because single failure protection is not required in these MODES. SR 3.8.1.13 requires verification that on an actual or simulated zone overlap signal each KHU's overhead tie breaker and underground tie breaker actuate to the correct position. This SR verifies redundancy between the KHU's in the ability to connect to the underground emergency power path. This redundancy is not required in MODES 5 and 6. SR 3.8.1.14 requires verification that each closed SL and closed N breaker opens on an actuation of each redundant trip coil. This SR verifies each trip circuit for each breaker independently opens each breaker. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because there is no requirement for the automatic transfer function to be OPERABLE when the Unit is in these MODES. SR 3.8.1.15 requires verification that each 230 kV

BASES

SURVEILLANCE REQUIREMENTS

3.8.2.1 (continued)

switchyard circuit breaker actuates to the correct position on an actual or simulated switchyard isolation actuation signal. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because there is no requirement for the switchyard isolation function to be OPERABLE when the Unit is in these MODES. SR 3.8.1.16 verifies that one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path. This SR is not required to be met in MODES 5 and 6 and during movement of irradiated fuel assemblies, because there is no requirement for providing this capability when the Unit is in these MODES.

The SR is modified by two Notes. Note 1 indicates that SR requirements to energize both standby buses may be reduced to require energizing only one standby bus and one main feeder bus. Reduced OPERABILITY requirements associated with MODES 5 and 6 and during movement of irradiated fuel may permit a reduction in requirements for energizing portions of the AC distribution system. Note 2 indicates that the SR 3.8.1.4 requirement to energize the underground power path is not applicable since the performance of this portion of the SR is only appropriate when both emergency power paths are required to be OPERABLE.

REFERENCES

1. 10 CFR 50.36.

Attachment 2

Markup of current TSB

NOTE: Additions are underlined
Deletions are noted by strikethrough.

B 3.3 INSTRUMENTATION

B 3.3.14 Emergency Feedwater (EFW) Pump Initiation Circuitry

BASES

BACKGROUND

EFW pump initiation circuitry is designed to provide safety grade means of controlling the secondary system as a heat sink for core decay heat removal. To ensure the secondary system remains a heat sink, the EFW pump initiation circuitry takes action to initiate EFW when the primary source of feedwater is lost. These actions ensure that a source of cooling water is available to be supplied to a steam generator (SG), thereby establishing the heat sink temperature at the saturation temperature of the secondary system.

EFW is initiated ~~to restore a source of cooling water to the secondary system when conditions~~ indicate that the normal source of feedwater is not ~~available~~. Loss of both main feedwater (MFW) ~~P~~pumps was chosen as an EFW automatic initiating parameter because it is a direct and immediate indicator of loss of MFW. ~~The EFW pump initiation circuitry contains devices that generate an EFW pump initiation signal when loss of main feedwater pumps are indicated by low hydraulic oil pressure.~~

Each EFW pump has two loss of main feedwater (LOMF) pump instrumentation channels. Each EFW pump LOMF pump instrumentation channel consists of a pressure switch monitoring a MFW pump turbine hydraulic oil pressure header. There are separate pressure switches for each EFW pump and each LOMF instrumentation channel, three monitoring MFW pump turbine "A" hydraulic oil pressure and three monitoring MFW pump turbine "B" hydraulic oil pressure.

Each EFW pump has an automatic initiation circuit. ~~Each~~An EFW ~~P~~pump automatic initiation circuit ~~is fed by~~ consists of two LOMF~~loss of main feedwater (LOMF)~~ instrumentation channels ~~(hydraulic oil pressure switches)~~and the subsequent relays and switches that provide the logic ties to the EFW pump start contactor / solenoid. An EFW pump initiation signal is generated when loss of both MFW pumps, indicated by low hydraulic oil pressure on both headers, satisfies the two-out-of-two logic to automatically initiate the EFW pump. ~~common only to that circuit which feed a two-out-of-two logic circuit that automatically starts each EFW pump. Each EFW pump also has a dedicated manual start circuit.~~

Each EFW pump also has a dedicated manual initiation circuit. A manual initiation circuit consists of those relays and switches that provide logic ties to the EFW pump start contactor / solenoid.

BASES

Resetting a MFW pump provides normal hydraulic oil pressure to the LOMF instrumentation channel pressure switches associated with that pump. The LOMF instrumentation channel would then provide a signal of not tripped to the EFW pump initiation circuits even though the MFW pump is not providing feedwater to the steam generators. Therefore,

BASES

~~BASES~~

BACKGROUND (continued)

administrative controls are in place to trip the LOMF instrumentation channels for a MFW pump prior to resetting the pump. Placing an LOMF channel in trip consists of isolating the LOMF instrument channel pressure switches such that they no longer provide a reset signal.

EFW is also initiated by a low level in the SG (after a 30 second delay to prevent spurious actuation) for SG dryout protection. EFW initiation for SG dryout protection is not required by this Specification. Finally, EFW is also initiated by a loss of both MFW pumps as indicated by low hydraulic oil pressure as part of the ATWS Mitigation Circuitry (AMSAC), which is a system provided to comply with the requirements to reduce risk from an anticipated transient without scram (ATWS). EFW initiation for ATWS mitigation is not required by this Specification.

Each motor driven EFW pump is normally controlled by a four-position, OFF-AUTO1-AUTO2-RUN, control switch located in the control room. The pump can be manually started by turning the control switch to the RUN position. In the AUTO1 mode, each motor-driven EFW pump starts automatically after a sustained low water level in either steam generator for greater than 30 seconds. In the AUTO2 Mode, each pump starts automatically on ~~low steam generator level or~~ loss of both ~~main feedwater~~MFW pumps (or on low steam generator level or ATWS initiation).

~~BACKGROUND (continued)~~

The turbine-driven EFW pump is started by opening valve MS-93 which admits steam to the pump turbine. A four-position, RUN-AUTO-OFF-PULL TO LOCK, control switch is provided to control operation of MS-93. The switch is maintained in the AUTO position. In the AUTO mode, MS-93 opens on ~~low hydraulic oil pressure in~~ loss of both MFW pumps (or ATWS initiation). When the switch is in the RUN position, MS-93 is opened.

APPLICABLE SAFETY ANALYSES

The transient which forms the basis for initiation of the EFW systems is a loss of MFW transient. In the analysis of the transient, MFW pump turbine low hydraulic oil pressure is the parameter assumed to automatically initiate EFW.

The EFW pump initiation circuitry satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

LCO

Two loss of main feedwater (LOMF) pump instrumentation channels, ~~and~~ an automatic initiation circuit, and a manual initiation circuit are required

BASES

OPERABLE for each EFW pump. ~~Each LOMF instrumentation channel is considered to include the sensors and measurement channels.~~ The LCO is modified by a Note that limits the OPERABILITY required ~~for~~ the automatic initiation circuitry to MODES 1 and 2.

APPLICABILITY

The initiation circuitry for EFW pumps shall be OPERABLE in MODES 1, 2 and 3 and in MODE 4 when the steam generator is relied upon for heat removal. In MODE 4 when the steam generator is not relied upon for heat removal, and MODES 5, and 6, the primary system temperatures are too low to allow the SGs to effectively remove energy and EFW Pump initiation instrumentation is not required to be OPERABLE.

ACTIONS

The ACTIONS are modified by a Note indicating that this Specification may be entered independently for each EFW pump initiation circuit. The Completion Time(s) of the inoperable channels for each EFW automatic initiation circuit are tracked separately for each circuit starting from the time the Condition is entered for that circuit.

BASES

LCO (continued)

An OPERABLE KHU must be capable of starting, accelerating to rated speed and voltage, ~~and connecting to the main feeder bus(es).~~ The ~~sequence~~ unit must then be capable of ~~being accomplished~~ within 23 seconds after a manual emergency start initiation signal. An emergency power source must be capable of accepting required loads and must continue to operate until offsite power can be restored to the main feeder buses.

This LCO is modified by three Notes. Note 1 indicates that a unit startup transformer may be shared with a unit in MODES 5 and 6. Note 2 indicates that the requirements of Specification 5.5.19, "Lee Combustion Turbine Testing Program," shall be met when a Lee Combustion Turbine (LCT) is used for the emergency power requirements. Note 3 indicates that the required emergency power source and the required offsite power source shall not be susceptible to a failure disabling both sources.

The required emergency power source and required offsite source cannot be susceptible to a failure disabling both sources. If the required offsite source is the 230 kV switchyard and the startup transformer energizing the required main feeder bus(es), the KHU and its required underground emergency power path are required to be OPERABLE since it is not subject to a failure, such as an inoperable startup transformer, which simultaneously disables the offsite source. If the Central switchyard is serving as the required offsite source through the CT-5 transformer with a power path through only one standby bus, the KHU and its required underground emergency power path cannot be used as the emergency power source if the power path is through the same standby bus since a single failure of a standby bus would disable both sources. Conversely, if an LCT is being used as an emergency power source, the required offsite source must be an offsite circuit available or connected through the startup transformer or a backcharged unit main step-up transformer and the unit auxiliary transformer.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of recently irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours) are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and