Entergy

Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72801
Tel 501-858-4888

C. Randy Hutchinson
Vice President
Operations ANO

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0CAN119904

U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station OP1-17
Washington, DC 20555

Subject: Arkansas Nuclear One - Unit 1 and Unit 2
Docket No. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Proposed Technical Specification Change Revising The Allowable Outage Time For The Startup #2 Transformer And Revise Emergency Diesel Generator Operability Verification Requirements For ANO-1

Gentlemen:

Attached for your review and approval are proposed changes to the Arkansas Nuclear One – Unit 1 (ANO-1) and Unit 2 (ANO-2) Technical Specifications (TS). The proposed changes affect the ANO-1 and ANO-2 Limiting Conditions for Operation and bases associated with the allowable outage time (AOT) of Startup Transformer #2 (SU#2). In addition, the requirements associated with demonstrating the operability of an emergency diesel generator (EDG) are being revised to enhance EDG reliability as recommended in NRC Generic Letter (GL) 84-15 "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" and the philosophies associated with the Revised Standard Technical Specifications (RSTS).

The proposed change to extend the SU#2 AOT is necessary to ensure the future reliability of the transformer. SU#2 is unique in that it is shared by ANO-1 and ANO-2 and, therefore, increases the complexities associated with scheduling a preventative maintenance window without resulting in the shutdown of either unit. The significant block of time required to complete appropriate preventative maintenance on SU#2 would require both ANO-1 and ANO-2 to be in cold shutdown (reactor coolant temperature ≤ 200°F) simultaneously due to the TS AOT constraints associated with higher modes of plant operation. Scheduling both ANO units to be off-line simultaneously is not prudent due to power generation requirements, outage costs, and manpower availability, among other reasons. Therefore, additional allowance is required in the case of SU#2 in order to provide for necessary preventative maintenance without needlessly jeopardizing the power operation of either ANO unit. Such extensive inspection and preventative maintenance should only need to be performed once every 10 years. The proposed change would add an additional AOT for SU#2, allowing the transformer to be removed from service for up to 30 days, not more than once in any 10 year period, if removed as part of a preplanned preventive maintenance activity. Because of the contingencies established and the large number of redundant power sources available to both units, it is not necessary to apply the provisions of TS 3.0.4 during the 30-day AOT period. Any unplanned inoperability of SU#2 will result in applying the existing TS AOTs (24 hours for ANO-1 and 72 hours for ANO-2).

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In addition to the aforementioned proposal regarding the SU#2 AOT, ANO proposes to revise the current action requirement concerning EDG inoperability as a method of enhancing EDG reliability. Current TS requirements result in excessive starting of the operable EDG during periods when another required power source (EDG or offsite power source) is inoperable. Excessive cold starts act to degrade the overall reliability of EDGs. The proposed TS revision eliminates the need for cold start tests in these instances. The single exception to such elimination is the requirement to perform a start test of the EDG within 24 hours if the loss of the redundant EDG was caused by a common cause failure. This proposal is consistent with the guidance within GL 84-15 and the guidance of RSTS, resulting in increased EDG reliability.

This proposed change has been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c) and it has been determined that this change involves no significant hazards considerations. The bases for these determinations are included in the attached submittal.

Entergy Operations requests prompt NRC review and approval of the proposed changes with an implementation period of 30 days.

Very truly yours,

C. Randy Hutchinson

CRH/dbb
Attachment

To the best of my knowledge and belief, the statements contained in this submittal are true.

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for Pope **County and the State of Arkansas, this** 16 **day of** November**, 1999.**

Andrea Pierce

Notary Public
My Commission Expires 12/15/2007

"OFFICIAL SEAL"
Andrea Pierce
Notary Public, State of Arkansas
County of Pope
My Commission Exp. 12/15/2007

cc: Mr. Ellis W. Merschoff
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

NRC Senior Resident Inspector
Arkansas Nuclear One
P.O. Box 310
London, AR 72847

Mr. Chris Nolan
NRR Project Manager Region IV/ANO-2
U. S. Nuclear Regulatory Commission
NRR Mail Stop 04-D-3
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Mr. David D. Snellings
Director, Division of Radiation
Control and Emergency Management
Arkansas Department of Health
4815 West Markham Street
Little Rock, AR 72205

ATTACHMENT 1

TO

0CAN119904

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. DPR-51 AND NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT ONE AND UNIT TWO

DOCKET NO. 50-313 AND 50-368

DESCRIPTION OF PROPOSED CHANGES

The proposed changes to the Arkansas Nuclear One, Unit 1 (ANO-1) and Unit 2 (ANO-2) Technical Specifications (TS) allow for a once per 10 year preplanned preventative maintenance outage of the Startup #2 Transformer (SU#2) of up to 30 days. In addition, the requirement for demonstrating the operability of an emergency diesel generator (EDG) during periods when another required power source (EDG or offsite power source) is inoperable due to reasons other than a common cause failure is deleted. The following changes are proposed:

- For ANO-1, Specification 3.7.2.B has been revised to remove the requirement for demonstrating the operability of EDGs when an offsite power source is out of service. Additionally, a statement is added to allow SU#2 to be removed from service for up to 30 days as part of a preplanned preventative maintenance program. The 30-day allowance may not be applied more than once in any 10-year period. TS 3.0.4 is not applicable during this 30-day period. Line spaces have also been included between each lettered item for readability purposes.

- For ANO-1, Specification 3.7.2.C has been revised to require a single operability demonstration of the remaining operable EDG within 24 hours (unless it is currently in operation) if there is indication that a common cause failure exists. If a common cause failure is not evident, testing of the remaining EDG is not required.

- For ANO-2, Specification 4.8.1.1.a. has been revised to remove the requirement for demonstrating the operability of EDGs when an offsite power source is out of service. Additionally, a statement is added to allow SU#2 to be removed from service for up to 30 days as part of a preplanned preventative maintenance program. The 30-day allowance may not be applied more than once in any 10-year period. TS 3.0.4 is not applicable during this 30-day period.

- For ANO-2, Specification 4.8.1.1.b has been revised to require a single operability demonstration of the remaining operable EDG within 24 hours (unless it is currently in operation) if there is indication that a common cause failure exists. If a common cause failure is not evident, testing of the remaining EDG is not required.

Additionally, information is added to the bases of both the ANO-1 and ANO-2 TSs, providing background and explanatory information relevant to the above revisions. For ANO-1, the last several lines of page 57b were moved to the top of page 57c due to space considerations. The following sections provide detailed discussion of the aforementioned changes. Because the proposed changes affect both units at Arkansas Nuclear One (ANO), any future reference to "ANO" will imply both ANO-1 and ANO-2, unless specifically stated otherwise.

BACKGROUND

Startup Transformer #2 Allowable Outage Time

The ANO switchyard consists of a 500 kilovolt (KV) yard and a 161 KV yard connected by a 600 mega-volt-amp (MVA) autotransformer bank with a 22 KV tertiary winding. Electrical power is supplied to the station switchyard by five separate transmission lines, three feeding the 500 KV ring bus and two feeding the 161 KV ring bus. Two physically independent circuits with startup transformers sized to carry plant essential loads are provided from the station switchyard to the onsite electrical distribution system. Startup Transformer #1 (SU#1) provides power to ANO-1 and Startup Transformer #3 (SU#3) provides power to ANO-2. Both SU#1 and SU#3 are powered from the 22 KV tertiary winding of the autotransformer via separate breakers and underground cabling systems. The SU#2 receives power from the 161 KV ring bus and is an additional source of power to both ANO-1 and ANO-2. A single line diagram illustrating the lines supplying SU#2 may be referenced in the Unit 2 Safety Analysis Report (SAR) Figure 8.2-2 or Unit 1 SAR Figure 8-1.

During power operation, auxiliary in-house loads are normally powered from the respective unit auxiliary transformers (UA). Each UA receives power from its respective unit's main generator. During non-power operations, station auxiliary loads are supplied from any of the aforementioned startup transformers. ANO-1 and ANO-2 are prevented from simultaneous automatic transfer to SU#2 during normal operation. However, procedures are available to administratively allow automatic access to SU#2 by either Unit 1 or Unit 2 for specifically analyzed conditions. The design basis load capability of SU#2 includes both of the ESF buses on both units, assuming an accident in progress on one unit and the orderly shutdown and cooldown of the second unit. In the event that all offsite power sources become unavailable, fully redundant EDGs (two per unit) will furnish power to Engineered Safeguards Features (ESF) equipment. A 4.4 MW alternate AC diesel generator (AACG) is also available to provide power to ESF or non-ESF auxiliary loads of both ANO-1 and ANO-2. The AACG, as a minimum, can simultaneously provide power to one ESF bus of one unit (accident conditions) and one ESF bus of the other unit (shutdown conditions).

SU#2 provides an additional task in supplying offsite power to in-house loads during flood conditions. The de-energizing of the 500/161 KV switchyard will be required at flood elevations of ≥ 356.5 feet. Therefore, prior to reaching these flood conditions, the 161 KV voltage regulator feeding SU#2 will need to be de-energized and bypassed. Temporary jumpers are then installed over the 161 KV switchyard to connect SU#2 directly to the 161 KV Morrilton East transmission line. Flood levels approaching an elevation of 354 feet would be an extremely unusual occurrence and, based upon historical data, would take from two days to several weeks to develop. This would allow more than sufficient lead-time for the procedures outlined above to be performed. All equipment connections necessary to maintain offsite power during flood conditions are above the 361-foot Probable Maximum Flood (PMF) elevation. Additionally, the Morrilton East transmission line has a minimum clearance of 17 feet above the 361-foot elevation.

Preventative maintenance activities can be completed on SU#1 and SU#3 during cold shutdown (reactor coolant temperature ≤ 200°F) conditions for the respective ANO unit. In cold shutdown, only one offsite power source is required to be operable. Thus, ANO-1 could perform extensive preventative maintenance on SU#1 while relying on SU#2 as the required offsite power source when the reactor is in the cold shutdown state, without undue risk to the unit's shutdown operations. This also applies to ANO-2 with respect to maintenance on SU#3. In order to perform similar maintenance on SU#2, however, both units at ANO would need to be in the cold shutdown state simultaneously for an extended period of time. This is due to the fact that SU#2 is the second TS offsite power source for both ANO-1 and ANO-2 and both ANO units are required to maintain two offsite power sources when above cold shutdown conditions. Attempting to perform such extensive preventative maintenance with either unit at power would result in the entry into a TS AOT of relatively short duration. The AOT for ANO-1 allows 24 hours to restore the transformer to an operable status. The AOT for ANO-2 allows 72 hours to restore the transformer to an operable status. A plant shutdown to cold shutdown is required if the transformer is not restored to an operable status within the AOT limits. As will be discussed in the next section of this submittal, little preventative maintenance could be performed in such a short period of time. In addition, ANO procedures limit pre-planned maintenance activities to 50% of the respective AOT, with activities projected to extend beyond this limit requiring specific management approval. During power operation, applying the 50% AOT limit would further limit SU#2 maintenance activities to a window of 12 hours for ANO-1 and 36 hours for ANO-2.

Due to power generation demands and economics, it is not prudent to schedule an overlapping, prolonged shutdown of both ANO units in order to accommodate a thorough preventative maintenance and inspection program for SU#2. Manpower availability during shutdown conditions is frequently limited. The large number of activities ongoing during shutdown conditions additionally result in greater challenges to scheduling and outage control personnel. In addition, as will be discussed in detail later in this submittal, probabilistic risk assessments indicate that these activities may be performed with both units at steady state power while resulting in an insignificant impact to overall station risk. Other significant factors include the frequently changing conditions of plant systems during shutdown operations (i.e., movement of irradiated fuel, reduced inventory, refueling testing activities, etc.). Many of these shutdown conditions administratively require two offsite power sources to be available and protected. Future outages are projected to be 25 days or less in duration with refueling activities requiring 15 of those days, preventing a reasonable window of sufficient duration for SU#2 maintenance. Therefore, performing SU#2 maintenance during power operation will allow for the highest probability of steady-state station conditions during the period in which the transformer's integrity is being enhanced through the completion of prudent preventative maintenance activities.

A discussion of the types of activities being planned for SU#2 and the associated time estimates associated with these activities is included in the following section of this submittal.

Demonstration of EDG Operability

NRC Generic Letter (GL) 84-15, "Proposed Staff Actions To Improve And Maintain Diesel Generator Reliability," recommended improvements to the TSs to reduce cold fast starts, rapid loading and excessive testing which impose severe mechanical stress and undue wear on engine parts. In the development of GL 84-15, the staff conducted a technical evaluation of Unresolved Safety Issue (USI) A-44 "Station Blackout." This evaluation generated the recommendations in GL 84-15 to reduce the risk of core damage from station blackout events. The reliability of the diesel generators has been identified as being one of the main factors affecting the risk from station blackout. Therefore, attaining and maintaining high reliability of diesel generators is a necessary factor in the resolution of USI A-44.

Current ANO-1 TSs require the immediate cold start of an EDG(s) when another required power source (EDG or offsite power source) becomes inoperable in order to demonstrate the operability of the remaining EDG(s). This operability verification is not required by ANO-2 TS if a single EDG is inoperable solely due to preplanned maintenance activities. The ANO-1 TS further requires that, in the case of an inoperable EDG, the redundant operable EDG be start tested on a daily basis as long as the inoperable condition exists on the other EDG. These requirements do not act to enhance EDG operability or conform to the recommendations of the aforementioned NRC documents. Therefore, ANO proposes to eliminate unnecessary cold starts of the EDGs in order to comply with the above recommendations and establish greater consistency with the Revised Standard Technical Specifications (RSTS).

The current RSTS does not require the demonstration of EDG operability due to the loss of another TS required power source. The exception to this is during an event that causes one EDG to become inoperable that may indicate the existence of a common cause failure (same degradation may affect operability of the remaining EDG). In this case, the remaining EDG is required to be demonstrated operable by performing a standard cold start test within 24 hours of the initial inoperability determination. Therefore, the recommendations of the aforementioned NRC documents have been effectively captured in the RSTS. Since ANO has not yet completed the respective conversion to RSTS format, a revision to current ANO TSs is proposed to incorporate the aforementioned NRC recommendations and the philosophies of the RSTS. The specific revisions and applicable specifications are discussed in the following section of this submittal.

DISCUSSION OF CHANGE

Startup Transformer #2 Allowable Outage Time

Given the importance of offsite power sources, it is prudent to maintain them in a reliable condition while minimizing their unavailability. Details associated with the preventative maintenance are discussed to provide adequate justification for the length of the proposed AOT for SU#2. In addition, the risk associated with extending the current SU#2 AOT and the contingencies that will be established to minimize such risk are also discussed. The following table represents an estimate of the work to be performed and the time associated with each activity. The information in this table is subject to change depending on the condition of the transformer at the time it is removed from service, the initial inspection results once it is removed from service, future degradations detected prior to performing the desired maintenance, industry experience, etc.

MAINTENANCE ACTIVITY	ESTIMATED TIME REQUIRED
Perform all tasks to isolate the transformer from all possible electrical sources	24 hours
Electrical testing of transformer, windings, bushings	24 hours
Drain oil, purge with air, and perform internal inspection	24 hours
Perform necessary core tightening and repairs	48 hours
Disassemble/clean transformer, coolers, and oil system	84 hours
Replace various relays, oil pumps, bladders, and bushings and reassemble	48 hours
Establish vacuum on transformer and prepare for oil addition	48 hours
Fill with oil, final electrical testing, touch-ups	36 hours
Mechanically reattach transformer electrical connections and energize	24 hours
TOTAL	**360 HOURS (15 DAYS)**

The above listing assumes maintenance is performed during a time of year when average temperatures remain at approximately 50°F or above. This prevents the need for hot oil bath drying which would lengthen the required maintenance window estimate. The estimated hours for each set of activities also assumes that work is performed around the clock, 24 hours a day and 7 days a week.

As stated previously, ANO policy allows entry into most TS AOTs provided the preplanned maintenance can be performed within approximately 50% of the AOT. Based on the information provided in the above table, an AOT of 30 days is appropriate to perform the desired maintenance. The purpose of the 50% limit on AOTs at ANO is to provide margin for unforeseen or unpredictable circumstances that may arise during the course of maintenance.

When considering an offsite power source such as SU#2, the intent of performing work within the 50% of the AOT limit also provides for unforeseen adverse weather conditions. Since the transformer is exposed to atmospheric conditions, maintenance on SU#2 could be halted during severe weather conditions, especially since the maintenance involves work around high voltage electrical equipment. Therefore, based on the above information, ANO requests an AOT for SU#2 of 30 days to support situations when such extensive, preplanned preventative maintenance may be required. The transformer will be returned to service and declared operable as soon as possible following completion of the maintenance and should not challenge the AOT.

Due to the costs and the number of contingencies to be established as a result of any SU#2 maintenance window, ANO plans to limit the number of times that a 30-day AOT would be applied. In defining an appropriate interval for performing the preventative maintenance activities, many factors come into play. One such factor is the extent to which the transformer will be used in the future. Longer plant outages or increased outage length could easily result in a dramatic increase in SU#2 usage. On the other hand, shorter outages could result in the opposite effect. Another example may be the ongoing upgrades of the 161 KV system and modifications to SU#2, which may eventually provide for its use as an automatic transfer source for either ANO unit. Since there is no established maintenance interval, ANO proposes a 10-year interval, based on good engineering practices, to be sufficient in maintaining the proper state of operation for SU#2. However, actual preplanned maintenance may be delayed beyond the 10-year interval should the physical condition of SU#2 remain favorable beyond this time period.

Current ANO procedures require contingency planning and risk assessments to be performed when removing any safety-related or TS-required piece of equipment from service. ANO has performed a probabilistic risk assessment (PRA) in order to calculate the associated increase in risk given a 30-day outage window for SU#2 and both units operating at power simultaneously. The resultant increase in risk fell into NRC Risk Region III ("Very Small Change") and it has been therefore concluded that the 30-day outage window for SU#2 is acceptable. The current ANO probabilistic safety assessment model employed is not applied to outage conditions and, therefore, no PRA results are included for conditions when one unit is shutdown while the other unit remains at power. However, as discussed previously, performing SU#2 maintenance with both units at power provides the most stable (unchanging) plant conditions and as illustrated above, provides only a fractional increase in overall risk. Entergy Operations, Inc. believes performing SU#2 maintenance with both units at power or with either unit shutdown is equally acceptable. Therefore, Entergy Operations, Inc. requests that the AOT not be limited to having one unit shutdown, but is provided the flexibility to perform this maintenance with both units operating.

Whether planned or unplanned, activities that result in the inoperability of a TS required offsite power source or the loss of an EDG require contingencies to be established that act to protect all other available sources of power. In the instance of SU#2 being removed from service for preplanned preventative maintenance, elective maintenance would not be allowed on SU#1, SU#3, or any of the EDGs that are supporting an operable bus on either unit.

Further guidance prevents any major elective maintenance activity from occurring in the ANO switchyard during the SU#2 outage. The AACG is also protected during such elective maintenance activities involving electrical power sources. In addition, the steam driven emergency feedwater pumps (one per unit) are likewise protected from elective maintenance activities since they are considered a mitigation to station blackout conditions when electric feedwater pumps would be unavailable. Surveillance testing of any such "protected" equipment that falls due during the period that SU#2 is out of service would generally be performed just prior to removing SU#2 from service to prevent jeopardizing such equipment during the SU#2 maintenance window. Risk strategies and maintenance practices at ANO also act to ensure spare parts are available and pre-staged, along with other support equipment that may be required prior to entry into the maintenance window. Other factors that are considered at ANO when offsite power sources are involved include the time of year (projected atmospheric stability), projected offsite power grid requirements, overall plant condition, availability of qualified personnel, etc. Because of the contingencies established and the large number of redundant power sources available to both units, it is not necessary to apply the provisions of TS 3.0.4 during the 30-day AOT period.

According to the National Weather Service in Fort Smith, Arkansas, the most active season for tornadic activity at ANO is during the months of March, April, and May. During this period, >50% of the total annual tornadic activity occurs. Excluding a direct hit of the ANO switchyard, any resulting tornado will most likely eliminate not more than one incoming feeder to the switchyard, thus sufficient offsite power sources are maintained. As stated previously, the maintenance window will additionally not be scheduled during periods when temperatures average <50°F. This limit, therefore, precludes performing the SU#2 maintenance from December through February. The most likely acceptable maintenance window for SU#2 will occur during the months of June through November. Existing programs at ANO provide for weather and plant condition assessments whenever removing a major piece of equipment from service. ANO believes its program is sufficient in identifying concerns, providing guidance, and allowing for the appropriate scheduling of the SU#2 preventative maintenance window.

Should the loss of another required electrical power source occur during the SU#2 maintenance window, the appropriate current TS AOT would be initiated. Such an occurrence would require ANO-1 to either initiate a hot shutdown within 12 hours, or enter TS 3.0.3, depending on the component being considered inoperable. ANO-2 would have 24 hours to restore one of the inoperable sources or be in hot standby in the following 6 hours, in addition to demonstrating the operability of both EDGs within 8 hours of a second power source being declared inoperable. If one of the inoperable power sources cannot be returned to service, the end result for both ANO units would be to place the plants in the cold shutdown condition. It should be noted that the ongoing effort to convert the present ANO-1 TSs to the revised standard version will result in the above ANO-1 AOTs being equivalent to that of the present ANO-2 AOTs. These AOTs are sufficient to ensure appropriate corrective actions are initiated in a timely manner and, if unsuccessful, ensure the units are placed in a safe shutdown condition. As discussed previously, should SU#2 become inoperable for any reason other than a scheduled, preplanned preventative maintenance window, the current TS AOTs of both ANO units would be applicable.

During the most limiting state of transformer maintenance, ANO has estimated that SU#2 could be reassembled and placed back in service within 48 hours should the need arise. As previously discussed, it is expected that two or more days would exist to prepare the ANO site for projected flood conditions. The return-to-service estimate above provides reasonable assurance that SU#2 may be made available, if needed, to provide an offsite power source to both ANO units should flood conditions be forecast. Not withstanding flood conditions, removable links may be disconnected at the main generator of either unit allowing the UA transformers to be powered directly from the switchyard via the Main Transformers should the respective unit be off-line and a loss of the associated SU#1 or SU#3 transformer unexpectedly occur. Such backfeed operations require approximately 24 hours to establish, therefore, sufficiently limiting the time in-house loads would be supplied from diesel generators.

Based on the above discussion, ANO requests the proposed revision to the current TSs of both ANO-1 and ANO-2, providing a 30-day AOT not more often than once every 10-years (i.e., a ≥ 10-year interval between applications of the 30-day AOT) for preplanned preventative maintenance to be performed on SU#2. Methodologies associated with risk monitoring and contingency action planning currently exist at ANO and provide acceptable assurance of continued safe reactor operations during periods of SU#2 inoperability. In summary, the following is a listing of contingencies or conditions that will be applicable during the proposed SU#2 preventative maintenance window:

1. All necessary equipment will be prestaged
2. Necessary personnel will be pre-assigned and verified available
3. The window will not be scheduled during the months of December through May
4. The AACG will not be used to supply power to the offsite grid
5. Major switchyard activities will be prevented
6. Surveillance of the following equipment will be performed prior to removing SU#2 from service (if the scheduled surveillance interval falls within the 30 day SU#2 window). In addition, this equipment will be posted and protected while SU#2 remains out of service.

    - Unit 1 and Unit 2 steam-driven emergency feedwater pumps
    - Startup transformers #1 and #3
    - Unit 1 emergency diesel generators #1 and #2
    - Unit 2 emergency diesel generators #1 and #2
    - AACG diesel generator

Demonstration of EDG Operability

As discussed in the previous section of this submittal, NRC recommendations and guidance have been provided through GL 84-15, and USI A-44 to increase the reliability of EDGs, thus enhancing the plant response during a station blackout event. The philosophies outlined in the RSTS indicate the incorporation of these recommendations, in part, by eliminating unnecessary cold start tests of EDGs. Therefore, ANO proposes to revise its current TSs, eliminating the requirement to demonstrate EDG operability due to the loss of another required power source (EDG or offsite power source), unless a common cause failure is evident that could conceivably render the remaining EDG inoperable. In this case, provisions to perform a start test of the remaining EDG within 24 hours of initial inoperability of the redundant EDG will be incorporated into the ANO-1 and ANO-2 TSs. This proposed revision will act to comply with the recommendations of the aforementioned NRC documents and establish greater consistency with the RSTS.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Entergy Operations, Inc. is proposing that the Arkansas Nuclear One, Unit 1 (ANO-1) and Unit 2 (ANO-2) Operating Licenses be amended to revise the allowable outage time (AOT) currently established for the Startup Transformer #2 (SU#2), a shared Unit 1 and Unit 2 component, for periods of inoperability as a result of preplanned preventative maintenance activities. The proposed SU#2 AOT of 30 days, not to be applied more than once in any 10-year period, will allow prudent preventative maintenance measures to be completed on SU#2 without jeopardizing the power operation of either ANO unit. Because of the contingencies established and the large number of redundant power sources available to both units, it is not necessary to apply the provisions of TS 3.0.4 during the 30-day AOT period. In addition, the ANO-1 and ANO-2 Operating Licenses are to be amended to provide enhanced reliability of the emergency diesel generators (EDG) by limiting the number of start tests required when other required power sources (EDG or offsite power source) are rendered inoperable.

An evaluation of the proposed changes has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the standards in 10CFR50.92(c). A discussion of these standards as they relate to this amendment request follows:

Criterion 1 - Does Not Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated.

Based on existing methodologies, guidance, and procedures utilized at ANO, including required assessments of risk associated with any significant maintenance activity, the provision of a 30-day AOT for preplanned preventative maintenance on SU#2 is acceptable. The resulting increase in overall risk was considered to fall into NRC Risk Region III ("Very Small Change"). Additionally, removal of SU#2 from service in any plant mode of operation has been previously evaluated and found acceptable given the existing guidance and regulations associated with offsite power sources.

Five offsite power feeds are available to the ANO switchyard with no more than two of the feeds in close proximity to one another for a given length, except within the switchyard itself. Failure of one feed, regardless of the cause, will result in no more than one additional failure, leaving at least three offsite power sources yet available, assuming the failure remains outside the ANO switchyard. For events that pose a threat within the ANO switchyard, four redundant Class 1E EDGs and one Alternate AC diesel generator are capable of supply power to the units. Upon loss of the remaining offsite power transformer of a unit which may be off-line, offsite power may be restored via backfeed operations from the Main Transformers to the Unit Auxiliary transformer to supply in-house loads. This ensures the availability of redundant power sources including the applicable contingencies established during safety-related equipment maintenance performed at ANO are sufficient in maintaining safe unit operations during preplanned preventative maintenance on SU#2 transformer.

Therefore, providing a 30-day AOT for preplanned preventative maintenance on SU#2, not to be applied more than once in any 10-year period, does not involve a significant increase in the probability or consequences of any accident previously evaluated.

The elimination of excessive EDG operability demonstrations (cold starts) during periods when another required power source is inoperable acts to enhance overall EDG reliability and is consistent with guidance provided in NRC Generic Letter 84-15 "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" and the Revised Standard Technical Specifications (NUREG 1430 and 1432). Verification of the operability of the remaining EDG will be performed within 24 hours should the failure mechanism that caused the inoperability of the redundant EDG be concluded to be a common cause type failure. The start test in the latter case acts to ensure that an EDG source remains available when the cause of the failure of the redundant EDG might impact the remaining EDG.

Therefore, eliminating excessive EDG cold starts does not involve a significant increase in the probability or consequences of any accident previously evaluated.

Criterion 2 - Does Not Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated.

The removal of SU#2 from service to support needed maintenance activities has been previously evaluated for all modes of plant operation. Extending the current AOT to 30 days on a limited basis does not result in any new accident initiator. The EDGs are not considered accident initiators, but are designed to support mitigation of accident scenarios. The elimination of excessive EDG cold starts acts to enhance overall EDG reliability and has no effect on accident development.

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

Criterion 3 - Does Not Involve a Significant Reduction in the Margin of Safety.

The associated probabilistic risk assessments indicate that the proposed 30-day AOT for SU#2 does not involve a significant increase in overall site risk, nor reduce the margin to safety. Thorough contingency action planning, which acts to maintain the operability of other equipment important to safety during the SU#2 maintenance window, additionally acts to ensure the margin to safety is maintained. The EDGs are important to safety in that they are designed to supply power to safety system components and equipment during a loss of offsite power. The elimination of excessive cold starts of the EDGs acts to enhance the overall reliability of the EDGs and, therefore, proper mitigation of accident scenarios is likewise enhanced.

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

Therefore, based on the reasoning presented above and the previous discussion of the amendment request, Entergy Operations, Inc. has determined that the requested change does not involve a significant hazards consideration.

ENVIRONMENTAL IMPACT EVALUATION

10 CFR 51.22(c) provides criteria for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released off-site, or (3) result in a significant increase in individual or cumulative occupational radiation exposure. Entergy Operations, Inc. has reviewed this license amendment and has determined that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the proposed license amendment. The bases for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.

2. As discussed in the significant hazards evaluation, this change does not result in a significant change or significant increase in the radiological doses for any Design Based Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.

3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because this does not modify the method of operation of systems and components necessary to prevent a radioactive release.

PROPOSED ANO-1 TECHNICAL SPECIFICATION CHANGES

3.7.2 A. The specifications in 3.7.1 may be modified to allow one of the following conditions to exist after the reactor has been heated above 200F. Except as indicated in the following conditions, if any of these conditions are not met, a hot shutdown shall be initiated within 12 hours. If the condition is not cleared within 24 hours, the reactor shall be brought to cold shutdown within an additional 24 hours.

B. In the event that one of the offsite power sources specified in 3.7.1.A (1 or 2) is inoperable, reactor operation may continue for up to 24 hours. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in any 10-year period. The provisions of Specification 3.0.4 are not applicable to Startup Transformer No. 2 during the 30-day preventative maintenance period.

C. Either one of the two diesel generators may be inoperable for up to 7 days in any month provided that there are no inoperable ESF components associated with the operable diesel generator and provided that the two sources of off-site power specified in 3.7.1.A(1) or 3.7.1.A(2) are available. The operability of the remaining diesel generator shall be demonstrated within 24 hours unless it is determined that a common cause failure does not exist or, unless it is currently in operation or has been demonstrated operable within the previous 24 hours.

D. Any 4160V, 480V, or 120V switchgear, load center, motor control center, or distribution panel in one of the two ESF distribution systems may be inoperable for up to 8 hours, provided that the operability of the diesel generator associated with the operable ESF distribution system is demonstrated immediately and all of the components of the operable distribution system are operable. If the ESF distribution system is not returned to service at the end of the 8 hour period, Specification 3.7.2.A shall apply.

E. DELETED

F. DELETED

G. DELETED

H. If the requirements of Specification 3.7.1.G cannot be met, either:

(1) place all Startup Transformer No. 2 feeder breakers in "pull-to-lock" within 1 hour, restore the inoperable interlocks to operable status within 30 days, or submit within 30 days a Special Report pursuant to Specification 6.12.5 outlining the cause of the failure, proposed corrective action and schedule for implementation; or

(2) apply the action requirements of Table 3.5.1-1, Note 14.

In the event that the offsite power sources specified in 3.7.1.A (1 or 2) are inoperable, the required capacity of one emergency storage tank plus one day tank (20, 160 gallons) will be sufficient for not less than three and one-half days operation for one diesel generator loaded to full capacity. (ANO-1 FSAR 8.2.2.3) The underground emergency storage tanks are gravity fed from the bulk storage tank and are normally full, while the day tanks are fed from transfer pumps which are capable of being cross connected at their suction and discharges and automatically receive fuel oil when their inventory is less than 180 gallons. Thus, at least a seven day total diesel oil inventory is available onsite for emergency diesel generator operation during complete loss of electric power conditions.

Technical Specification 3.7.2 allows for the temporary modification of the specifications in 3.7.1 provided that backup system(s) are operable with safe reactor operation and combined availability of the engineered safety features ensured. The requirements for diesel generators are consistent with Generic Letter 84-15, "Proposed Staff Actions to Improve And Maintain Diesel Generator Reliability" and the Revised Standard Technical Specifications (NUREG 1430). The evaluation of a common cause failure (degradation that may affect the operability of the remaining diesel generator) should be completed within 24 hours from when the affected diesel generator is determined to be inoperable.

Technical Specifications 3.7.1.F and 3.7.1.G provide assurance that the Startup Transformer No. 2 loads will not contribute to a sustained degraded grid voltage situation. This will protect ESF equipment from damage caused by sustained undervoltage.

The 125 VDC electrical power system consists of two independent and redundant safety related class 1E DC electrical subsystems. Each subsystem consists of one 100% capacity 125 VDC battery, its associated battery charger, and its distribution network. Additionally, there is one spare battery charger per subsystem, which provides backup service in the event that the preferred battery charger is out of service.

If one of the required DC electrical power subsystems is inoperable (e.g., inoperable battery, no operable battery charger, or inoperable battery and no operable associated battery charger), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst-case single failure would, however, result in the complete loss of the remaining 125 VDC electrical power subsystems with attendant loss of ES functions, continued power operation should not exceed 8 hours.

Battery cell parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational event or a postulated design basis accident. Cell parameter limits are conservatively established, allowing continued DC electrical system function even with Table 4.6-1 Category A and B limits not met.

With one or more cells in one or more batteries not within limits (i.e., Table 4.6-1 Category A limits not met, or Category B limits not met, or Category A and B limits not met) but within the Table 4.6-1 Category C limits, the battery is degraded but has sufficient capacity to perform its intended function. Therefore, the battery is not required to be considered inoperable solely as a result of Category A or B limits not met, and continued operation is permitted for a limited period of time. The pilot cell electrolyte level and float voltage are required to be verified to meet the Table 4.6-1 Category C limits within 1 hour (TS 3.7.4.A.1). These checks will provide a quick representative status of the remainder of the battery cells. Verification that the Table 4.6-1 Category C limits are met (TS 3.7.4.A.2) provides assurance that

during the time needed to restore the parameters to within the Category A and B limits, the battery will still be capable of performing its intended function. This verification is repeated at 7 day intervals until the parameters are restored to within Category A and B limits. This periodic verification is consistent with the increased potential to exceed these battery parameter limits during these conditions.

With one or more batteries with one or more battery cell parameters outside the Table 4.6-1 Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not assured. Therefore, the battery must be immediately declared inoperable and the corresponding DC electrical power subsystem must be declared inoperable.

Additionally, other potentially extreme conditions, such as electrolyte temperature of the pilot cell falling below 60°F, average electrolyte temperature of representative cells falling below 60°F or battery terminal voltage below the limit are also cause for immediately declaring the associated DC electrical power subsystem inoperable.

An allowance has been provided, extending the allowable outage time for Startup Transformer No. 2 only, for up to 30 days. The 30-day allowance is permitted not more than once in any 10-year period, which is considered sufficient for proper maintenance of the transformer. The 30-day window should permit extensive preplanned preventative maintenance without placing either unit in an action statement of short duration and would allow both units to be operating during such maintenance. Because this allowance assumes parts are prestaged, appropriate personnel are available, and proper contingencies have been established, it is not intended to be used for an unexpected loss of the transformer. Pre-established contingencies will consider the projected stability of the offsite electrical grid, the atmospheric stability projected for the maintenance window, the ability to adequately control other ongoing plant maintenance activities that coincide with the window, projected flood levels, and the availability of all other power sources. Since a station blackout is the most affected event that could occur when power sources are inoperable, the steam driven emergency feedwater pump will also be maintained available during the evolution.

PROPOSED ANO-2 TECHNICAL SPECIFICATION CHANGES

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

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

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system and

b. Two separate and independent diesel generators each with:

1. A day fuel tank containing a minimum volume of 280 gallons of fuel (equivalent to 50% of indicated tank volume),

2. A separate fuel storage system containing a minimum volume of 22,500 gallons of fuel (equivalent to 100% of indicated tank level), and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite A.C. circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in a 10-year period. The provisions of Specification 3.0.4 are not applicable to Startup Transformer No. 2 during the 30-day preventative maintenance period.

b. With one diesel generator of the above required A.C. electrical power source inoperable, demonstrate the OPERABILITY of both the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours unless it is determined that a common cause failure does not exist or, unless it is currently in operation or has been demonstrated OPERABLE within the previous 24 hours. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source. ACTION requirements are consistent with Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" and the Revised Standard Technical Specifications (NUREG 1432). The evaluation of a common cause failure (degradation that may affect the OPERABILITY of the remaining diesel generator) should be completed within 24 hours from when the affected diesel generator is determined to be inoperable.

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies", March 10, 1971, and 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants", Revision 1, August 1977 and Generic Letter 84-15. Load Ranges provided in surveillances are allowed to avoid routine overloading of diesel generators. Load in excess of these load ranges for special testing, momentary variation due to changing bus loads, or short term variations shall not invalidate surveillance tests. For the purpose of surveillance testing, the term "standby condition" is defined as the approximate temperature range of the jacket cooling water and engine lube oil sump normally maintained by the engine keep warm system. An exception to this definition is the engine conditions that exist when performing the hot restart test following the 24 hour EDG endurance run. When performing this test, the engine is near normal operating temperature when in a "standby condition". Additionally, this definition includes the allowance to perform engine prelubrication prior to all planned test starts.

The Diesel Generator Test Schedule, Table 4.8-1 has been developed for the purpose of determining testing requirements based on the number of failures and valid tests using the example provided in Generic Letter 84-15 using a per diesel generator unit basis. The criteria of R.G.1.108 position C.2.e is used for criterial determination.

TS 4.8.1.2.c.3 demonstrates the EDG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency while maintaining a specified margin to the overspeed trip. For ANO-2, the single load for each EDG is the Service Water pump, rated at 800 HP (636.9 KW).

Containment electrical penetrations and penetration conductors are protected by either de-energizing circuits not required during reactor operation or by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers during periodic surveillance. The 480 volt air frame protective devices utilize electro-mechanical overcurrent elements which are mounted on the protective device and, in some instances, protective relays to trip the protective device. Actuation of the overcurrent element or relay will trip the protective device. The molded case protective devices utilize magnetic or thermal-magnetic overcurrent elements which are contained in the protective device. Actuation of each overcurrent element will trip the protective device.

TS 3.8.2.3 Action "b" requires the performance of SR 4.8.2.3.a.1 within one hour and at least once per 8 hours thereafter for a loss of one of the required full capacity chargers. If any Category A limit in Table 4.8-2 is not met while a charger is inoperable, the associated battery bank shall be declared inoperable and ACTION "a" entered. The Category A limits in Table 4.8-2 specify the normal limits for electrolyte level, float voltage and specific gravity for each designated pilot cell. When TS 3.8.2.3 ACTION "b" is entered without the associated battery bank being on float (i.e. charger not connected to the bus), pilot cell float voltage is determined by measuring pilot cell voltage. The term "full capacity charger" as used in TS 3.8.2.3 is defined as a charger that is capable of supplying an output of ≥ 300 amperes.

An allowance has been provided, extending the allowable outage time for Startup Transformer No. 2 only, for up to 30 days. The 30-day allowance is permitted not more than once in any 10-year period, which is considered sufficient for proper maintenance of the transformer. The 30-day window should permit extensive preplanned preventative maintenance without placing either unit in an action statement of short duration and would allow both units to be operating during such maintenance. Because this allowance assumes parts are prestaged, appropriate personnel are available, and proper contingencies have been established, it is not intended to be used for an unexpected loss of the transformer. Pre-established contingencies will consider the projected stability of the offsite electrical grid, the atmospheric stability projected for the maintenance window, the ability to adequately control other ongoing plant maintenance activities that coincide with the window, projected flood levels, and the availability of all other power sources. Since a station blackout is the most affected event that could occur when power sources are inoperable, the steam driven emergency feedwater pump will also be maintained available during the evolution.

MARKUP OF CURRENT ANO-1 AND ANO-2 TECHNICAL SPECIFICATIONS

(FOR INFO ONLY)

3.7.2 A. The specifications in 3.7.1 may be modified to allow one of the following conditions to exist after the reactor has been heated above 200F. Except as indicated in the following conditions, if any of these conditions are not met, a hot shutdown shall be initiated within 12 hours. If the condition is not cleared within 24 hours, the reactor shall be brought to cold shutdown within an additional 24 hours.

B. In the event that one of the offsite power sources specified in 3.7.1.A (1 or 2) is inoperable, reactor operation may continue for up to 24 hours. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in any 10-year period. The provisions of Specification 3.0.4 are not applicable to Startup Transformer No. 2 during the 30-day preventative maintenance period. ~~if the availability of the diesel generators is immediately verified.~~

C. Either one of the two diesel generators may be inoperable for up to 7 days in any month provided that ~~during such 7 days the operability of the remaining diesel generator is demonstrated immediately and daily thereafter,~~ there are no inoperable ESF components associated with the operable diesel generator~~,~~ and provided that the two sources of off-site power specified in 3.7.1.A(1) or 3.7.1.A(2) are available. The operability of the remaining diesel generator shall be demonstrated within 24 hours unless it is determined that a common cause failure does not exist or, unless it is currently in operation or has been demonstrated operable within the previous 24 hours.

D. Any 4160V, 480V, or 120V switchgear, load center, motor control center, or distribution panel in one of the two ESF distribution systems may be inoperable for up to 8 hours, provided that the operability of the diesel generator associated with the operable ESF distribution system is demonstrated immediately and all of the components of the operable distribution system are operable. If the ESF distribution system is not returned to service at the end of the 8 hour period, Specification 3.7.2.A shall apply.

E. DELETED

F. DELETED

G. DELETED

H. If the requirements of Specification 3.7.1.G cannot be met, either:

(1) place all Startup Transformer No. 2 feeder breakers in "pull-to-lock" within 1 hour, restore the inoperable interlocks to operable status within 30 days, or submit within 30 days a Special Report pursuant to Specification 6.12.5 outlining the cause of the failure, proposed corrective action and schedule for implementation; or

(2) apply the action requirements of Table 3.5.1-1, Note 14.

In the event that the offsite power sources specified in 3.7.1.A (1 or 2) are inoperable, the required capacity of one emergency storage tank plus one day tank (20, 160 gallons) will be sufficient for not less than three and one-half days operation for one diesel generator loaded to full capacity. (ANO-1 FSAR 8.2.2.3) The underground emergency storage tanks are gravity fed from the bulk storage tank and are normally full, while the day tanks are fed from transfer pumps which are capable of being cross connected at their suction and discharges and automatically receive fuel oil when their inventory is less than 180 gallons. Thus, at least a seven day total diesel oil inventory is available onsite for emergency diesel generator operation during complete loss of electric power conditions.

Technical Specification 3.7.2 allows for the temporary modification of the specifications in 3.7.1 provided that backup system(s) are operable with safe reactor operation and combined availability of the engineered safety features ensured. The requirements for diesel generators are consistent with Generic Letter 84-15, "Proposed Staff Actions to Improve And Maintain Diesel Generator Reliability" and the Revised Standard Technical Specifications (NUREG 1430). The evaluation of a common cause failure (degradation that may affect the operability of the remaining diesel generator) should be completed within 24 hours from when the affected diesel generator is determined to be inoperable.

Technical Specifications 3.7.1.F and 3.7.1.G provide assurance that the Startup Transformer No. 2 loads will not contribute to a sustained degraded grid voltage situation. This will protect ESF equipment from damage caused by sustained undervoltage.

The 125 VDC electrical power system consists of two independent and redundant safety related class 1E DC electrical subsystems. Each subsystem consists of one 100% capacity 125 VDC battery, its associated battery charger, and its distribution network. Additionally, there is one spare battery charger per subsystem, which provides backup service in the event that the preferred battery charger is out of service.

If one of the required DC electrical power subsystems is inoperable (e.g., inoperable battery, no operable battery charger, or inoperable battery and no operable associated battery charger), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst-case single failure would, however, result in the complete loss of the remaining 125 VDC electrical power subsystems with attendant loss of ES functions, continued power operation should not exceed 8 hours.

Battery cell parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational event or a postulated design basis accident. Cell parameter limits are conservatively established, allowing continued DC electrical system function even with Table 4.6-1 Category A and B limits not met.

With one or more cells in one or more batteries not within limits (i.e., Table 4.6-1 Category A limits not met, or Category B limits not met, or Category A and B limits not met) but within the Table 4.6-1 Category C limits, the battery is degraded but has sufficient capacity to perform its intended function. Therefore, the battery is not required to be considered inoperable solely as a result of Category A or B limits not met, and continued operation is permitted for a limited period of time. The pilot cell electrolyte level and float voltage are required to be verified to meet the Table 4.6-1 Category C limits within 1 hour (TS 3.7.4.A.1). These checks will provide a quick representative status of the remainder of the battery cells. Verification that the Table 4.6-1 Category C limits are met (TS 3.7.4.A.2) provides assurance that

during the time needed to restore the parameters to within the Category A and B limits, the battery will still be capable of performing its intended function. This verification is repeated at 7 day intervals until the parameters are restored to within Category A and B limits. This periodic verification is consistent with the increased potential to exceed these battery parameter limits during these conditions.

With one or more batteries with one or more battery cell parameters outside the Table 4.6-1 Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not assured. Therefore, the battery must be immediately declared inoperable and the corresponding DC electrical power subsystem must be declared inoperable.

Additionally, other potentially extreme conditions, such as electrolyte temperature of the pilot cell falling below 60°F, average electrolyte temperature of representative cells falling below 60°F or battery terminal voltage below the limit are also cause for immediately declaring the associated DC electrical power subsystem inoperable.

An allowance has been provided, extending the allowable outage time for Startup Transformer No. 2 for up to 30 days. The 30-day allowance is permitted not more than once in any 10-year period, which is considered sufficient for proper maintenance of the transformer. The 30-day window should permit extensive preplanned preventative maintenance without placing either unit in an action statement of short duration and would allow both units to be operating during such maintenance. Because this allowance assumes parts are prestaged, appropriate personnel are available, and proper contingencies have been established, it is not intended to be used for an unexpected loss of the transformer. Pre-established contingencies will consider the projected stability of the offsite electrical grid, the atmospheric stability projected for the maintenance window, the ability to adequately control other ongoing plant maintenance activities that coincide with the window, projected flood levels, and the availability of all other power sources. Since a station blackout is the most affected event that could occur when power sources are inoperable, the steam driven emergency feedwater pump will also be maintained available during the evolution.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

LIMITING CONDITION FOR OPERATION

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

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system and

b. Two separate and independent diesel generators each with:

1. A day fuel tank containing a minimum volume of 280 gallons of fuel (equivalent to 50% of indicated tank volume),

2. A separate fuel storage system containing a minimum volume of 22,500 gallons of fuel (equivalent to 100% of indicated tank level), and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one offsite A.C. circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. ~~If either diesel generator has not been successfully tested within the past 24 hours, demonstrate its OPERABILITY by performing Surveillance Requirement 4.8.1.1.2.a.4 separately for each diesel generator (unless it is already opera-ting) within 24 hours.~~ Restore the offsite A.C. circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Startup Transformer No. 2 may be removed from service for up to 30 days as part of a preplanned preventative maintenance schedule. The 30-day allowance may be applied not more than once in a 10-year period. The provisions of Specification 3.0.4 are not applicable to Startup Transformer No. 2 during the 30-day preventative maintenance period.

b. With one diesel generator of the above required A.C. electrical power source inoperable, demonstrate the OPERABILITY of both the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. ~~If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate~~ Demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours ~~(unless it has been successfully tested in the last 24 hours or is already operating)~~ unless it is determined that a common cause failure does not exist or, unless it is currently in operation or has been demonstrated OPERABLE within the previous 24 hours. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source. ACTION requirements are consistent with Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability~~.~~" and the Revised Standard Technical Specifications (NUREG 1432). The evaluation of a common cause failure (degradation that may affect the OPERABILITY of the remaining diesel generator) should be completed within 24 hours from when the affected diesel generator is determined to be inoperable.

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies", March 10, 1971, and 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants", Revision 1, August 1977 and Generic Letter 84-15. Load Ranges provided in surveillances are allowed to avoid routine overloading of diesel generators. Load in excess of these load ranges for special testing, momentary variation due to changing bus loads, or short term variations shall not invalidate surveillance tests. For the purpose of surveillance testing, the term "standby condition" is defined as the approximate temperature range of the jacket cooling water and engine lube oil sump normally maintained by the engine keep warm system. An exception to this definition is the engine conditions that exist when performing the hot restart test following the 24 hour EDG endurance run. When performing this test, the engine is near normal operating temperature when in a "standby condition". Additionally, this definition includes the allowance to perform engine prelubrication prior to all planned test starts.

The Diesel Generator Test Schedule, Table 4.8-1 has been developed for the purpose of determining testing requirements based on the number of failures and valid tests using the example provided in Generic Letter 84-15 using a per diesel generator unit basis. The criteria of R.G.1.108 position C.2.e is used for criterial determination.

TS 4.8.1.2.c.3 demonstrates the EDG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency while maintaining a specified margin to the overspeed trip. For ANO-2, the single load for each EDG is the Service Water pump, rated at 800 HP (636.9 KW).

Containment electrical penetrations and penetration conductors are protected by either de-energizing circuits not required during reactor operation or by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers during periodic surveillance. The 480 volt air frame protective devices utilize electro-mechanical overcurrent elements which are mounted on the protective device and, in some instances, protective relays to trip the protective device. Actuation of the overcurrent element or relay will trip the protective device. The molded case protective devices utilize magnetic or thermal-magnetic overcurrent elements which are contained in the protective device. Actuation of each overcurrent element will trip the protective device.

TS 3.8.2.3 Action "b" requires the performance of SR 4.8.2.3.a.1 within one hour and at least once per 8 hours thereafter for a loss of one of the required full capacity chargers. If any Category A limit in Table 4.8-2 is not met while a charger is inoperable, the associated battery bank shall be declared inoperable and ACTION "a" entered. The Category A limits in Table 4.8-2 specify the normal limits for electrolyte level, float voltage and specific gravity for each designated pilot cell. When TS 3.8.2.3 ACTION "b" is entered without the associated battery bank being on float (i.e. charger not connected to the bus), pilot cell float voltage is determined by measuring pilot cell voltage. The term "full capacity charger" as used in TS 3.8.2.3 is defined as a charger that is capable of supplying an output of ≥ 300 amperes.

An allowance has been provided, extending the allowable outage time for Startup Transformer No. 2 for up to 30 days. The 30-day allowance is permitted not more than once in any 10-year period, which is considered sufficient for proper maintenance of the transformer. The 30-day window should permit extensive preplanned preventative maintenance without placing either unit in an action statement of short duration and would allow both units to be operating during such maintenance. Because this allowance assumes parts are prestaged, appropriate personnel are available, and proper contingencies have been established, it is not intended to be used for an unexpected loss of the transformer. Pre-established contingencies will consider the projected stability of the offsite electrical grid, the atmospheric stability projected for the maintenance window, the ability to adequately control other ongoing plant maintenance activities that coincide with the window, projected flood levels, and the availability of all other power sources. Since a station blackout is the most affected event that could occur when power sources are inoperable, the steam driven emergency feedwater pump will also be maintained available during the evolution.