

ComEd Response to Generic Question No. 1

In response to the NRC staff Request for Additional Information (RAI), the following discussion provides a revised Significant Hazards Consideration for TSUP Section 3/4.9. The revised evaluation satisfies RAI Generic Question No. 1. NRC Staff Generic Question No. 1 requested the following:

In review of proposed Technical Specification Upgrade Program (TSUP) Sections 3.1, 3.2, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, and 5.0, the No Significant Hazards Consideration for these applications are not completely accurate and the wording used in the evaluations are confusing. The considerations did not take into account the relaxation of the current Technical Specification (TS) requirement with the adoption of the proposed Standard Technical Specifications (STS). In addition, the staff discovered typographical errors in the considerations. The staff requests that Commonwealth Edison Company (ComEd) re-evaluate the No Significant Hazards Consideration for each application covering the sections listed above and supplement the applications by providing an accurate and complete No Significant Hazards Consideration.

The following provides ComEd's revised No Significant Hazards Evaluation for TSUP Section 3/4.9. ComEd will provide responses to Generic Question No. 1 for other Sections of TSUP under separate transmittal.

Commonwealth Edison has evaluated this proposed amendment and determined that it involves no significant hazards consideration. In accordance with the criteria of 10 CFR 50.92 (c) a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility, in accordance with the proposed amendment, would not:

# Involve a significant increase in the probability or consequences of an accident previously evaluated because:

In general, the proposed amendment represents the conversion of current requirements to a more generic format, or the addition of requirements that are based on the current safety analyses. Implementation of these changes will provide increased reliability of equipment assumed to operate in the current safety analyses, or provide continued assurance that specified parameters remain within their acceptance limits, and as such, will not significantly increase the probability or consequences of a previously evaluated accident.

Some proposed changes represent minor curtailments of the current requirements that are based on generic guidance or previously approved provisions for other stations. The proposed amendment is consistent with the current safety analyses and has been previously determined to represent sufficient requirements for the assurance and reliability of equipment assumed to operate in the safety analyses, or provide continued assurance that specified parameters remain within their acceptance limits. As such, these changes will not significantly increase the probability or consequences of a previously evaluated accident.

<u>A.C. Sources - Operating:</u> The proposed amendment for Section 3/4.9.A, "A.C. Sources - Operating," incorporates the requirements of STS, where applicable, to Dresden and Quad Cities Stations. Most deviations from the STS requirements are based upon generic guidance and other approved requirements at other sites and do not significantly increase the probability or consequences of any previously evaluated accidents at Dresden and Quad Cities Stations. Dresden and Quad Cities Stations are retaining the current allowed outage time from their current specifications for loss of an Emergency Diesel Generator (EDG). However, a verification of EDG operability has been proposed for midway through the seven-day AOT.

Both Dresden and Quad Cities Station's EDG history have shown them to be very reliable. This can be shown by the excellent pass rate observed during the monthly surveillance tests. As stated previously, the addition of several new STS enhancements (or any deviations from STS requirements) to fuel storage and transfer requirements and other miscellaneous EDG surveillances recommended by ASTM codes will improve EDG reliability. Therefore, because the EDG's for Dresden and Quad Cities Stations do not act as accident initiators, the probability of an accident previously evaluated for the sites is not increased by the incorporation of the proposed requirements.

Other changes based upon STS guidance are more restrictive and limit operation of the site with respect to all A.C. power sources. A.C. power sources do not act as initiators of accidents. Therefore, the probability of an accident previously evaluated for the sites is

also not increased by the incorporation of the STS requirements.

Because more restrictions and limitations are added to the current versions of both Dresden and Quad Cities specifications and the current allowable outage times for the EDG's and the offsite power sources are retained, the consequences of any previously evaluated accident are not increased by the proposed changes.

<u>A.C. Sources - Shutdown:</u> The proposed amendment for Section 3/4.9.B, "A.C. Sources - Shutdown," incorporates the requirements of STS where applicable to Dresden or Quad Cities Station. The STS requirements and/or any deviations add additional restrictions for EDG fuel storage capability. There are also additional STS restrictions and/or any deviations proposed for fuel handling type of activities. Therefore, the proposed changes do not involve a significant increase in the probability or consequences of any previously evaluated accident for Dresden and Quad Cities Station.

D.C. Sources - Operating: The proposed amendment for Section 3/4.9.C, "D.C. Sources -Operating," incorporates the requirements of STS where applicable for Dresden or Quad Cities Stations. Any deviations from STS requirements do not significantly increase the probability or consequences of any previously evaluated accidents for Dresden or Quad Cities Stations. Dresden and Quad Cities are proposing to retain the current provisions specified in the current versions of the Dresden or Quad Cities Technical Specifications, respectively. The current plant's 125 VDC system AOT may be extended for up to a maximum period of 7 days with both units operating if the alternate 125 VDC battery is operable. The current 125 VDC requirements are different when compared to the STS requirements. However, the STS requirements as applied to the Dresden and Quad Cities battery systems would prove to be too burdensome requiring dual unit shutdowns to perform most maintenance or testing activities. The additional batteries in the design of the stations, with their surveillances, charger requirements, and breaker verifications, compensate for any STS deviations. The proposed requirements are consistent to the existing requirements and AOTs for Dresden and Quad Cities Stations; therefore, the consequences of any previously evaluated accident are not increased. The proposed amendment adds additional surveillance requirements to the D.C. systems at Dresden and Quad Cities Station to enhance their reliability and operational readiness. This also ensures the consequences of any previously evaluated accident are not increased. The D.C. system is not assumed as an accident initiator, thus, the probability of any previously evaluated accident is not increased.

<u>D.C. Sources - Shutdown</u>: The proposed amendment for Section 3/4.9.D, "D.C. Sources -Shutdown," incorporates the requirements of STS where applicable to Dresden or Quad Cities Station. Any deviations from STS requirements do not significantly increase the probability or consequences of any previously evaluated accidents for Dresden or Quad Cities Stations. The proposed amendment adds additional surveillance requirements and explicitly clarifies LCO's. The additional provision for fuel handling type of activities reduces the probability of previously evaluated accidents from occurring. The additional surveillance activities also improve D.C. reliability and thus, reduce the probability of D.C. system unavailability and therefore, reduce the consequences of previously evaluated accidents. The D.C. system is not considered as an accident initiator, thus, the probability of any previously evaluated accident is not increased.

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COMED TSUP RAI RESPONSE

<u>Distribution - Operating</u>: The proposed amendment for Section 3/4.9.E, "Distribution - Operating," incorporates the requirements of STS where applicable to Dresden or Quad Cities Station. Any deviations from STS requirements do not significantly increase the probability or consequences of any previously evaluated accidents for Dresden or Quad Cities Stations. The proposed amendment adds additional surveillance requirements and LCO's. The proposed requirements/actions for the D.C. distribution system are retained to be consistent to the proposed AOTs for the D.C. system. The STS requirements as applied to the Dresden/Quad Cities D.C. distribution system would prove to be too burdensome, requiring plant shutdowns to perform maintenance or testing activities. The additional distribution system surveillance and LCO's compensate for the STS deviations. The proposed requirements are comparable to the existing requirements and AOTs for Dresden or Quad Cities Stations. The additional surveillances and STS-type requirements ensures the reliability and operational readiness of the Distribution System. The Distribution System is not assumed as an accident initiator, thus, the probability of any previously evaluated accident is not increased.

<u>Distribution - Shutdown</u>: The proposed amendment for Section 3/4.9.F, "Distribution - Shutdown," incorporates the requirements of STS where applicable for Dresden and Quad Cities Station. The proposed amendment adds additional requirements. Any deviations from STS requirements do not significantly increase the probability or consequences of any previously evaluated accidents for Dresden or Quad Cities Stations.

<u>RPS Power Monitoring</u>: The proposed amendment for Section 3/4.9.G, "RPS Power Monitoring," incorporates the requirements of STS where applicable for Dresden or Quad Cities Station. The proposed amendment adds and/or clarifies requirements for Dresden and Quad Cities Stations. Any deviations from STS requirements do not significantly increase the probability or consequences of any previously evaluated accidents for Dresden or Quad Cities Stations.

# Create the possibility of a new or different kind of accident from any previously evaluated because:

In general, the proposed amendment represents the conversion of current requirements to a more generic format, or the addition of requirements that are based on the current safety analyses. Others represent minor curtailments of the current requirements that are based on generic guidance or previously approved provisions for other stations. These changes do not involve revisions to the design of the station. Some changes may involve revision in the operation of the station; however, these provide additional restrictions that are in accordance with the safety analyses, or are to provide for additional testing or surveillances that will not introduce new failure mechanisms beyond those already considered in the current safety analyses. The retention of the current AOTs for EDGs, offsite power sources, and DC systems maintain the existing assumptions from the accident analyses; therefore, these changes will not create the possibility of a new or different kind of accident from any previously evaluated.

The proposed amendment for Dresden and Quad Cities Station's Technical Specification Section 3/4.9 is based on STS guidelines or NRC accepted changes for later operating BWR plants'. The proposed amendment has been reviewed for acceptability at Dresden

and Quad Cities Nuclear Power Stations considering similarity of system or component design versus the STS or later operating BWRs. Any deviations from STS requirements do not create the possibility of a new or different type of accident than previously evaluated for Dresden or Quad Cities Stations. No new modes of operation are introduced by the proposed amendment, considering the acceptable operational modes in present specifications, the STS, or later operating BWRs. Surveillance requirements are changed to reflect improvements in technique, frequency of performance or operating experience at later plants. Proposed changes to action statements in many places add requirements that are not in the present Technical Specifications or adopt requirements that have been used successfully at other operating BWRs with designs similar to Dresden and Quad Cities. The proposed amendment maintains at least the present level of operability. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

#### Involve a significant reduction in the margin of safety because:

In general, the proposed amendment represents the conversion of current requirements to a more generic format, or the addition of requirements that are based on the safety analyses. Others represent minor curtailments of the current requirements that are based on generic guidance or previously approved provisions for other stations. Some later individual items may introduce minor reductions in the margin of safety when compared to the current requirements. However, other individual changes are the adoption of new requirements that will provide significant enhancement of the reliability of the equipment assumed to operate in the safety analyses, or provide enhanced assurance that specified parameters remain with their acceptance limits. These enhancements compensate for the individual minor reductions, such that taken together, the proposed changes will not significantly reduce the overall margin of safety.

The proposed amendment to Technical Specification Section 3/4.9 implements present requirements, or the intent of present requirements in accordance with the guidelines set forth in the STS. Any deviations from STS requirements do not significantly reduce the margin of safety for Dresden or Quad Cities Stations. The proposed amendment is intended to improve readability, usability, and the understanding of technical specification requirements while maintaining acceptable levels of safe operation. The proposed changes have been evaluated and found acceptable for use at Dresden and Quad Cities based on system design, safety analysis' requirements and operational performance. The retention of the current AOTs for EDGs, offsite power sources, and DC systems maintain the existing assumptions from the accident analyses. Since the proposed changes are based on NRC accepted provisions at other operating plants that are applicable at Dresden and Quad Cities and maintain necessary levels of system, component or parameter readability, the proposed changes do not involve a significant reduction in the margin of safety.

ComEd Response to Generic Question No. 2

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In response to the NRC staff Request for Additional Information (RAI), the following discussion compares the current Technical Specification (CTS) requirements at Dresden (DR) and Quad Cities (QCS) to those proposed in the Technical Specification Upgrade Program (TSUP). This comparison satisfies RAI Generic Question No. 2. NRC Staff Generic Question No. 2 requested the following:

In review of proposed TSUP Sections 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, and 5.0, ComEd did not evaluate and provide justification for the relaxations and deviations between current TS requirements and the proposed TS. ComEd has compared only the proposed TS to the STS and provided justification for any deviations. To allow the staff to perform a complete and accurate review of the above proposed TSUP TS sections, please provide supplemental evaluations of any changes or deviations between the current TS and the proposed TS. In addition, for each deviation or relaxation between the current TS and the proposed TS an evaluation should be provided which demonstrates that the proposed TS maintains the current licensing basis as described in the Updated Final Safety Analysis Report.

In response to the above NRC staff question, the following evaluation provides a line-byline comparison of the current DR and QCS TS requirements to the proposed TSUP requirements and includes ComEd's basis for acceptance of the proposed TSUP Section 3/4.9 requirements. All deviations from current DR and QCS TS requirements have been evaluated by ComEd and are discussed below.

Previous comparisons made between the Draft Revision 4, of the BWR/4 Standard Technical Specifications (STS) and the proposed TSUP submittals have been previously provided to the NRC staff. Some but not all information from the previous TSUP submittals may be included below to provide the best response to the NRC staff's RAI.

#### CTS 3/4.9.A

#### <u>General</u>

1. CTS 3/4.9 requirements for Auxiliary Electrical Systems are encompassed within proposed TSUP 3/4.9, "Auxiliary Electrical Systems." TSUP 3/4.9.A is based on STS Section 3/4.8.1.

# **Applicability**

- 1. The current Applicability and Objective statements included in CTS 3/4.9 for both the Dresden (DR) and Quad Cities (QCS) have been deleted. These statements are inappropriate for inclusion in the Technical Specification and have been superseded by BWR/4 Standard Technical Specifications (STS) applicability requirements (NUREG-0123).
- 2. Proposed TSUP Section 3/4.9.A, "AC Sources Operating," incorporates the requirements of the STS Section 3/4.8.1.1. The CTS applicability for the Normal and

Emergency A-C Auxiliary Power sources is before making the reactor critical. The applicability is expanded in accordance with STS requirements to include Operational Modes 1, 2 and 3. As a result, operability requirements are added for Hot Shutdown which is not in the current Technical Specifications (CTS). This change is a conservative upgrade to STS requirements and does not reduce plant safety margins nor does it affect any accident analyses previously evaluated for Dresden or Quad Cities Stations.

# Limiting Conditions for Operation (LCO)

- 1. CTS 3.9.A is encompassed within proposed TSUP 3.9.A, Applicability. This issue has been previously discussed in CTS 3.9.A, Applicability, Item No. 2 above. The proposed requirements are based on STS 3.8.1.1, Applicability.
- 2. CTS 3.9.A.1 for Dresden and CTS 3.9.A.2 for Quad Cities is encompassed within proposed TSUP 3.9.A.1. The proposed TSUP requirements are based on STS 3.8.1.1.a. The specific design details for the 135/345 kv power lines and associated equipment is relocated to administrative controls as this information is inappropriate for inclusion as a Technical Specification requirement. The proposed requirements continue to assure that sufficient controls related to the off-site transmission network and the onsite distribution system are in place at Dresden and Quad Cities Stations.
- 3. In CTS 3.9.A.1 for Dresden and CTS 3.9.A.2 for Quad Cities, the term available as applied to an off-site power line and/or associated transformer, has been replaced with the term OPERABLE in proposed TSUP 3.9.A.1. The present requirement for availability is unclear to adequately control the electrical power systems. OPERABLE is consistent to industry standards, is defined in TSUP Section 1.0 and provides enhanced guidance to site operations personnel to disposition potential degraded electrical transmission system concerns.
- 4. CTS 3.9.A.2 for Dresden is encompassed within proposed TSUP 3.9.A.2. TSUP 3.9.A.2 is based on STS 3.8.1.1.b.1. The proposed requirements continue to assure that sufficient controls related to the emergency diesel generators are in place at Dresden and Quad Cities Stations.
- 5. CTS 3.9.A.3 is encompassed within proposed TSUP 3.9.A.1. As previously discussed, TSUP 3.9.A.1 is based on STS 3.8.1.1.a. The proposed requirements continue to assure that sufficient controls related to the alternate circuitry are in place at Dresden and Quad Cities Stations.
- 6. CTS 3.9.A.4(a) for Dresden and CTS 3.9.A.4.a for Quad Cities is encompassed within proposed TSUP 3.9.E.1.a. TSUP 3.9.E.1.a is based on STS 3.8.3.1. In addition, TSUP 3/4.9.F provides new additional requirements for the electrical power distribution system during SHUTDOWN conditions. These Specifications are adopted directly from STS except that, as above, only a single action is sufficient for 3.9.F. Current Specifications 3.9.A.4.a and 3.9.A.4.b [Quad Cities] are used in the development of

proposed Specification 3.9.E/4.9.E, Distribution - Operating. The operability scope of this specification is defined by current provisions for A.C. power distribution, as the appropriate 4160-volt buses and 480-volt buses. The current Technical Specifications do not contain requirements for 120-volt vital services. The proposed change would add the RPS Essential Service Bus and 120-volt Instrument Bus. These busses are the primary sources of electrical power for much of the required safety related instrumentation.

- 7. Regarding proposed TSUP 3/4.9.E, present Technical Specifications do not address D.C power distribution systems. According to STS guidelines, appropriate D.C. motor control centers are added. The energization of the specified D.C. distribution systems provides necessary power to systems that are required to be operable. The proposed Applicability implements the present intent of 3.9.A [Quad Cities] such that buses are energized before making the reactor critical and STS guidelines. Proposed Actions for the Power Distribution Systems - Operating are added from STS guidelines since provisions currently do not exist. The proposed action allows 8 hours to re-energize a required A.C. distribution system or initiate shutdown of the reactor. With one of the required D.C. distribution systems inoperable, 2 hours is allowed to re-energize the system or a reactor shutdown is required. Present specifications do not contain provisions for Power Distribution Systems while the plant is shutdown or while conducting handling of irradiated fuel in the secondary containment. Proposed Specification 3.9.F/4.9.F addresses these conditions and adds requirements based on STS guidelines. Proposed operability requirement 3.9.F includes requirements for one A.C. and one D.C. distribution system to be operable during periods when fuel is in the reactor vessel, during refueling and when handling irradiated fuel in the secondary containment or during any work that has a potential for draining the reactor vessel. The proposed Action Statement specifies that with less than the required systems energized, alterations of the reactor core are to be suspended and handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel are stopped. The proposed Action Statement implements STS guidelines by providing an exception to the reactor shutdown provisions of Specification 3.0.A. This proposed exception applies only to the condition of moving irradiated fuel in the secondary containment when all fuel has been removed from the reactor vessel and the plant is not considered to be in any **Operational Mode.**
- 8. CTS 3.9.A.4(b) for Dresden and CTS 3.9.A.4.b for Quad Cities is encompassed within proposed TSUP 3.9.E.1.b. TSUP 3.9.E.1.b is based on STS 3.8.3.1. A more complete discussion of these requirements are provided in CTS 3/4.9.A, LCO, Item No. 6 above.
- 9. CTS 3.9.A.5 for Dresden is encompassed within proposed TSUP 3.9.C. Proposed TSUP Section 3/4.9.C, "DC Sources Operating," incorporates the requirements of the STS Section 3/4.8.2.1. The proposed applicability encompasses the present requirement of "prior to criticality" and STS guidelines that also includes conditions where the reactor is in the Hot Shutdown condition. The proposed specifications are consistent to the current licensing basis and expand required Operational Modes. Proposed Actions 4, 5

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and 6 are taken from the STS battery cell parameter table. These are required actions with specific time frames for completion of activities. Removing such actions from table notes is one of the improvements of TSUP. A corresponding change to the LCO is included so that a need to enter the Action is retained.

- 10. Proposed SRs 4.9.C.1 through 4.9.C.6 are taken from STS guidelines. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each connection provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The limits established for Surveillance Requirements 4.9.C.2.b and 3.c shall be no more than 20% above the resistance as measured during installation or not above the ceiling value established by the manufacturer. Verifying the average temperature of representative cells is consistent with the recommendations of IEEE-450 and ensures that lower-than-normal temperatures do not reduce battery capacity.
- 11. Proposed SRs 4.9.C.4 through 4.9.C.6 provide battery testing requirements consistent with STS except that either actual or simulated loading is allowed per the latest design approved load profile. The proposed changes are consistent to the CTS requirements and do not reduce existing plant safety margins.
- 12. Proposed SR 4.9.C.4 deviates from STS requirements. The specific surveillance requirements listed in STS 4.8.2.1.d.2 were not included in proposed TSUP SR 4.9.C as this information is more appropriate for owner-controlled documentation. In addition, proposed TSUP SR 4.9.C.4 is consistent to the battery system and Technical Specification requirements at Dresden and Quad Cities Stations. The current Technical Specification surveillance requires "...the unit's batteries shall be tested to verify that the battery capacity is adequate to supply and maintain operable the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test." Therefore, there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.C.4 requirements.
- 13. TSUP SR 4.9.C.4 is for the battery service test. A battery service test is a special test of the battery's capability to satisfy the design requirements (duty cycle) of the DC electrical power system. The 60-month test is performed as SR 4.9.C.5. SR 4.9.C.5 is the battery performance test. A battery performance test is a test of constant current capacity of a battery to detect any change in the capacity determined by the original installation acceptance test. The test is intended to determine general battery degradation due to age and usage. Therefore, there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.C.4 requirements and the CTS is enhanced by the addition of specific Technical Specification acceptance criteria.
- 14. Proposed Table 4.9.C-1 deviates from STS requirements as it places note "b" in the

box associated with Specific Gravity and Limits For Each Connected Cell. Proposed TSUP Table 4.9.C-1 is consistent to the battery system requirements at Dresden and Quad Cities Stations. The CTS surveillance requires "...the specific gravity, voltage and temperature of the pilot cell and overall battery voltage shall be measured." There are no specific acceptance criteria of any kind mentioned in the CTS. Proposed TSUP Table 4.9.C-1 is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Therefore, there is no reduction in existing plant safety margins by the proposed TSUP Table 4.9.C-1 requirements and the CTS is enhanced by the addition of specific Technical Specification acceptance criteria.

15. Proposed Footnote (a) under SR 4.9.C and 4.9.D allows the use of an alternate 125V battery that deviates from STS requirements. The alternate battery is a backup battery system used to enhance system availability - the 125 VDC system is not designed as a fully redundant, independent, redundant train system. As such, the alternate batteries are not required to meet the 125 VDC system design basis and are not used except to support battery testing. To use the backup system as a contingency for the normal battery system for a short period, the alternate battery must meet all operability requirements as shown by the associated Surveillance Requirements. At the conclusion of the Action statement, it is necessary to return the normal 125 VDC system to service. The exclusion of the alternate batteries from the Limiting Condition for Operation is consistent to the current licensing basis and does not reduce existing plant safety margins.

#### Surveillance Requirements

- CTS 4.9.A.1 (weekly battery SR) for Dresden is encompassed within proposed TSUP 4.9.C (Table 4.9.C-1). TSUP 4.9.C is based upon STS 4.8.2.1. TSUP 4.9.C.1 specifies weekly SR for the 125/250 VDC systems. TSUP 4.9.C.2 specifies quarterly or weekly (following battery discharge) SR for the 125/250 VDC systems. The proposed voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each connection provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The limits established for Surveillance Requirements 4.9.C.2.b and 3.c shall be no more than 20% above the resistance as measured during installation or not above the ceiling value established by the manufacturer. Verifying the average temperature of representative cells is consistent with the recommendations of IEEE-450 and ensures that lowerthan-normal temperatures do not act to inhibit or reduce battery capacity.
- CTS 4.9.A.2 (quarterly battery SR) for Dresden is encompassed within proposed TSUP 4.9.C.1 (Table 4.9.C-1). TSUP 4.9.C is based upon STS 4.8.2.1. TSUP 4.9.C.2 specifies quarterly or weekly (following battery discharge) SR for the 125/250 VDC systems. A more complete discussion regarding battery SRs is provided in the discussion of CTS 3/4.9.A, SR, Item No. 1 above.

- 3. CTS 4.9.A.3 (operating cycle battery SR) for Dresden is encompassed within proposed TSUP 4.9.C.2, 4.9.C.3 and TSUP 4.9.C.4. TSUP 4.9.C is based upon STS 4.8.2.1. TSUP 4.9.C.4 is equivalent to Dresden CTS 4.9.A.3 except for reference to determining specific gravity and voltage after each service test. This reference is encompassed within proposed TSUP 4.9.C.2 which specifies that seven days following battery discharge, a check of Table 4.9.C-1 requirements is mandated. Table 4.9.C-1 includes specific gravity and voltage requirements. In addition, TSUP 4.9.C.3 specifies other new battery SR on an 18-month basis which provides additional assurances that the 125/250 VDC system at Dresden and Quad Cities are tested at a frequency of greater regularity. It should be noted that proposed SR 4.9.C.4 deviates from STS requirements. The specific surveillance requirements listed in STS 4.8.2.1.d.2 were not included in proposed TSUP SR 4.9.C as this information is more appropriate for owner-controlled documentation. The term operating cycle has been conservatively replaced by proposed TSUP surveillance frequency of every 18 months which provides a uniform, constant surveillance frequency. The proposed TSUP requirements are consistent to industry standards which have been demonstrated to provide adequate assurance of maintaining battery operability. The current requirements are vague and do not provide a closed-end SR frequency (the definition in the CTS for operating cycle is open-ended).
- 4. CTS 4.9.A.4 (60-month battery SR) for Dresden is encompassed within proposed TSUP 4.9.C.5. TSUP 4.9.C is based upon STS 4.8.2.1. The current requirements are equivalent to the proposed requirements.
- 5. CTS 4.9.A.5 for Dresden is encompassed within proposed TSUP 4.9.C.6. TSUP 4.9.C is based upon STS 4.8.2.1. The term operating cycle has been conservatively replaced by proposed TSUP surveillance frequency of every 18 months which provides a uniform, constant surveillance frequency. The proposed TSUP requirements are consistent to industry standards which have been demonstrated to provide adequate assurance of maintaining battery operability. The current requirements are vague and do not provide a closed-end SR frequency (the definition in the CTS for operating cycle is open-ended).
- 6. CTS 4.9.A.6 for Dresden is encompassed within proposed TSUP 4.9.C, Footnote (a). TSUP 4.9.C is based upon STS 4.8.2.1. Proposed Footnote (a) under SR 4.9.C and 4.9.D allows the use of an alternate 125V battery that deviates from STS requirements. The alternate battery is a backup battery system used to enhance system availability the 125 VDC system is not designed as a fully redundant, independent, redundant train type of system. As such, the alternate batteries are not required to meet the 125 VDC system design basis and potentially may never be used except to support battery testing demonstrations. To use the backup system as a contingency to replace the normal battery system for a short period, the alternate battery must meet all operability requirements as shown by the associated Surveillance Requirements. At the conclusion of the Action statement, it is necessary to return the normal 125 VDC system to service. The exclusion of the alternate batteriate batteries from the Limiting Condition for Operation is consistent to the CTS (4.9.A.6

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at Dresden and 4.9.B.6 at Quad Cities) and does not reduce existing plant safety margins.

- 7. CTS 4.9.A.1.a(1) [monthly EDG start test] for Quad Cities is encompassed within proposed TSUP 4.9.A.2.c. The proposed requirements are based on STS 4.8.1.1.2.a.4. Proposed SR 4.9.A.2 has associated proposed Footnote (a) which states: "All planned diesel generator tests shall be conducted in accordance with manufacturer's recommendations regarding engine prelube, leak detection and warmup procedures, and as applicable regarding loading and shutdown recommendations." This deviates from STS SR 4.8.1.1.2, Note "\*". EDG starts without prior engine prelube create unnecessary engine wear, thereby reducing total EDG reliability. The engine prelube does not result in an enhanced start performance that could mask the engine's ability to start in accident conditions without a prelube. Therefore, the prelube allowance is included for all SRs requiring an EDG start. In addition, the proposed requirements are consistent or more restrictive than the CTS. Proposed TSUP SR 4.9.A.2, Footnote (a) is also consistent to the requirements specified in GL 93-05 and the Improved Standard Technical Specifications (ITS - NUREG - 1433). Proposed SRs 4.9.A.2.c also state that the EDG should start and "...accelerate to synchronous speed..." This deviates from STS SR 4.8.1.1.2.a.4 and SR 4.8.1.1.2, note "\*". The requirement to obtain a specified minimum speed (rpm) is redundant to the requirement to obtain the specified frequency (Hz) range since the minimum frequency range is at the same point. In addition, the proposed requirements are consistent or more restrictive than the CTS which do not include any such requirement. Proposed TSUP SR 4.9.A.2.c is also consistent to the requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Therefore, there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A.2, footnote (a) requirements and the CTS is enhanced by the additional Technical Specification surveillance requirement.
- 8. CTS 4.9.A.1.a(2) [monthly EDG load test] for Quad Cities is encompassed within proposed TSUP 4.9.A.2.d. The proposed requirements are based on STS 4.8.1.1.2.a.5. The proposed requirements add specific criteria (kw band) against which OPERABILITY can be verified. CTS specifies that the EDG shall be fully loaded - no specific criteria is provided. As such, the proposed requirements provide enhanced guidance to site operations personnel for determining an acceptable level of performance associated with the EDG.
- 9. CTS 4.9.A.1.b [EDG air compressor checks] for Quad Cities is encompassed within proposed TSUP 4.9.A.2.f. The proposed requirements are based on STS 4.8.1.1.2.a.7. Proposed SR 4.9.A.2.f allows taking one EDG starting air receiver tank out of service. This is not specified in the current Technical Specification and deviates from STS requirements (SR 4.8.1.1.2.a.7). The CTS do not provide an LCO for EDG starting air tanks. The CTS requirements specify that the EDG starting air compressor shall be checked for operation and its ability to recharge air receivers. The proposed specifications allow redundant air receiver system components to be out-of-service. The design of the system includes suitable redundancy such that the proposed

specifications do not adversely affect the design function of the system. TSUP SR 4.9.A.2.f is more restrictive than the CTS as it provides an acceptance limit to which the EDG starting air receiver tanks must achieve. The CTS requirements do not specify operability criteria. The proposed requirements are more restrictive than the CTS and provide enhanced guidance to site operating personnel as compared to the CTS criteria.

- 10. CTS 4.9.A.1.c [EDG fuel pump checks] for Quad Cities is encompassed within proposed TSUP 4.9.A.2.b. The proposed requirements are consistent to STS 4.8.1.1.2.a.3. The proposed TSUP requirements add specific guidance to site operations personnel that enhance the ability to adequately address potential degraded conditions associated with the EDG fuel transfer system. The proposed TSUP provisions require that the fuel oil transfer system be OPERABLE - present provisions only specify that the system be operated without requiring OPERABILITY. The proposed requirements are consistent to STS 4.8.1.1.2.3.
- CTS 4.9.A.2 for Quad Cities is encompassed within proposed TSUP 4.9.A.1.a. The 11. proposed surveillance frequency has been changed from a daily check of status to a verification of OPERABILITY every seven days. CTS 4.9.A.2 for Quad Cities requires checking of the 345-kV lines, switchgear and reserve auxiliary transformer on a daily basis. Proposed TSUP 4.9.A.1.a specifies a verification of the OPERABILITY of the same equipment every seven days. Although the proposed amendment reduces the periodicity of the surveillance, CTS requirements are vague and provide little guidance to site operating personnel regarding the disposition of OPERABILITY of the associated equipment (a status check of the equipment is all that is specified). The proposed TSUP requirements provide more specific details, thus ensuring equipment OPERABILITY can be properly dispositioned. The proposed requirements have been shown to be acceptable based upon industry experience for similar equipment consistent in design to Dresden and Quad Cities Stations. Therefore, the proposed Surveillance Requirements provide enhanced OPERABILITY requirements for the off-site transmission distribution network and therefore, the relaxation in periodicity does not significantly reduce existing plant safety margins.
- 12. CTS 4.9.A.3 for Quad Cities is encompassed within proposed TSUP 4.9.A.1.a. The proposed surveillance frequency has been changed from a daily status to a verification of OPERABILITY every seven days. Although the proposed amendment reduces the periodicity of the surveillance, current requirements are vague and provide insufficient guidance to site operating personnel regarding the disposition of OPERABILITY of the associated equipment (a check of the equipment is all that is specified). The proposed TSUP requirements provide specific details, thus equipment OPERABILITY can be properly dispositioned. The proposed requirements have been shown to be acceptable based upon industry experience for similar equipment consistent in design to Dresden and Quad Cities Stations. Therefore, the proposed Surveillance Requirements provide specific OPERABILITY requirements for the off-site transmission distribution network, the relaxation in

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periodicity does not significantly reduce existing plant safety margins. Proposed SR 4.9.A.1.b does not include testing the automatic transfer feature that is tested in the STS SR 4.8.1.1.1.b. The automatic feature discussed in STS 4.8.1.1.1.b is not consistent to the system design at Dresden or Quad Cities Stations. At Dresden and Quad Cities, the system is manually initiated. Therefore, the automatic transfer capability surveillance was not included in TSUP 4.9.A.1.b. The proposed TSUP package is consistent or more conservative than the current requirements (there are no current Technical Specification surveillances governing the manual transfer from the normal to the alternate circuit).

- CTS 4.9.A.4 for Quad Cities is encompassed within proposed TSUP 4.9.E. The 13. proposed surveillance frequency has been changed from a daily check of the buses to a weekly verification of energization. Current SR 4.9.A.4 [at Quad Cities] requires a daily check of the Unit engineered safety features 4160-volt and 480-volt buses. This current SR is replaced with the STS SR that is a seven-day test for verification of energization of the required buses by checking for correct breaker alignment and proper voltage. The STS seven-day test frequency with the added STS Action provisions provide assurance of required onsite power distribution system operability. Although the proposed amendment reduces the periodicity of the surveillance, current requirements are vague and provide insufficient guidance to site operating personnel regarding the disposition of OPERABILITY of the associated equipment (a status check of the equipment is all that is specified). The proposed TSUP requirements provide more specific details, thus ensuring equipment OPERABILITY can be properly dispositioned. The proposed requirements have been shown to be acceptable based upon industry experience for similar equipment consistent in design to Dresden or Quad Cities Stations. The proposed Surveillance Requirements provide enhanced OPERABILITY requirements for the electrical distribution network, the relaxation in periodicity does not significantly reduce existing plant safety margins. Proposed Surveillance Requirement 4.9.F is similar to the test requirements specified in 4.9.E for Distribution - Operating.
- 14. Proposed surveillances SR 4.9.A.9 and 4.9.A.10 are new requirements incorporated per STS 4.8.1.1.2.g except chemicals are not specified in 4.9.A.10 to allow their use only if needed. ASME requirements are also not included since the diesel generator support systems are not designed to ASME requirements. Currently no such requirements exist in the Dresden or Quad Cities' Technical Specifications.
- 15. Proposed Table 4.9.A-1 are new requirements adopted from STS with revisions per Generic Letter 84-15 and per approved revisions at Limerick Station. Additionally, note (a) is revised to reference the latest guidance (Draft Regulatory Guide 1.9 Revision 3) for validity of tests and failures. However, if ComEd adopts GL 94-01 requirements, Table 4.9.A-1 will be removed from the Technical Specifications and relocated to administrative controls. The adoption of GL 94-01 may be considered for inclusion in the TS at a later time. These changes clarify the guidance to update the requirements to the most current applicable industry standards.

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16. Proposed SR 4.9.A.10 are new requirements that deviate from STS language (SR 4.8.1.1.2.g) as it does not include pressure testing the system. The diesel generator support systems are not designed to ASME requirements. STS SR 4.8.1.1.2.g.2 refers to those portions of the oil system designed to ASME requirements. Because the associated system described in the STS does not meet those criteria, STS SR 4.8.1.1.2.g.2 is not applicable to the Dresden or Quad Cities EDG system design. In addition, it should be noted that TSUP SR 4.9.A.10 is an entirely new surveillance requirement and not part of the licensing basis. Proposed TSUP SR 4.9.A.10 is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). There is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A.10 requirements and the existing plant safety margins are enhanced by the additional Technical Specification surveillance requirements.

# <u>CTS 3/4.9.B</u>

# **Applicability**

 CTS 3.9.B for Dresden provides information to support the applicability of CTS 3.9.A. Exceptions are provided in CTS 3.9.B for Dresden. The exceptions to the CTS applicability are intended as action requirements from the Limiting Conditions for Operations in CTS 3.9.A for Dresden for EDGs, offsite lines and batteries. The applicability of CTS 3.9.A is specified for the availability of electric power as all modes except when the reactor is in Cold Shutdown or the Refueling modes of operation. Such requirements are encompassed within proposed TSUP 3.9.A, Applicability, as previously discussed. CTS 3.9.B for Quad provides information to support the applicability of station batteries. The applicability for station batteries is specified as before the reactor can be made critical. Such requirements are encompassed within proposed TSUP 3.9.C, Applicability, as previously discussed.

# Limiting Conditions for Operation (LCO)

- 1. CTS 3.9.B for Dresden [general applicability] is encompassed within proposed TSUP 3.9.A, Applicability. The exceptions to the CTS applicability are intended as action requirements from the Limiting Conditions for Operations in CTS 3.9.A for Dresden for EDGs, offsite lines and batteries. The proposed requirements are based on STS 3.8.1.1, Applicability. The present applicability for the Normal and Emergency A-C Auxiliary Power sources requires the provisions of CTS 3.9.A be met before making the reactor critical. The applicability is expanded in accordance with STS requirements to include Operational Modes 1, 2 and 3. As a result, operability requirements are added for Hot Shutdown which is not in the current Technical Specifications. This change is an upgrade to STS requirements and does not reduce plant safety margins nor does it affect any accident analyses previously evaluated for Dresden or Quad Cities Stations.
- 2. CTS 3.9.B.1 for Dresden [power from one line] is encompassed within TSUP 3.9.A,

Actions 1 and 2. The proposed requirements are based on STS 3.8.1.1, Action 1. STS 3.8.1.1, Action 1 is split into separate actions as proposed TSUP Actions 1 and 2 under proposed LCO 3.9.A for offsite and onsite power sources similar to the format of LaSalle County's current Specifications. The proposed specification requires that in the event one (1) offsite line is inoperable, the other offsite line shall be demonstrated operable by checking breaker alignments . . . within a one (1) hour time period and every eight (8) hours afterward. In addition, if an emergency diesel generator (EDG) has not been tested within the past 24 hours, an unloaded start of the EDG is required within 24 hours and again within 72 hours thereafter. The proposed AOT is for seven (7) days. The proposed Action is consistent to the current Technical Specifications at Dresden and Quad Cities that allows a 7-day allowable-outage-time (AOT). If the single line remains inoperable after seven days, the unit is required to be in Hot Shutdown (Mode 3) in the next 12 hours, and Cold Shutdown (Mode 4) in the following 24 hours. The current specifications at Dresden Station, 3.9.B.1 specify that if there is only one available offsite line, the site is allowed to remain in that condition for seven days provided both the unit and shared EDG's are operable and the other offsite line is available. There are no current explicit requirements for actions in the event these conditions cannot be met. Therefore, the site is required by current specifications 3.0.A to be in Hot Shutdown in 12 hours and Cold Shutdown within the following 24 hours. Current Quad Cities specification, 3.9.C.1, is similar to Dresden's requirements. This change is an administrative upgrade to STS nomenclature and does not reduce existing plant safety margins nor does it affect any accident analyses previously evaluated for Dresden or Quad Cities Stations. The purpose of the change is to clarify the appropriate plant conditions for which these requirements apply and the specific actions that are necessary in the event the plant cannot meet the specified conditions. Proposed Action statements' 1.b and 2.b under proposed LCO 3.9.A requires demonstrating EDG operability within 24 hours of losing one source of off-site power (if not successfully proven within the past 24 hours), with a recheck within 72 hours. The Standard Technical Specifications (STS) has more stringent requirements of an initial check within one hour and rechecks every 8 hours (STS 3.8.1.1, Action a). The proposed changes ensure that EDG reliability is maintained at Dresden and Quad Cities Stations without compromising EDG availability. The proposed changes are consistent to the requirements outlined in GL 93-05 and the Improved Standard Technical Specifications (ITS - NUREG - 1433) in that GL 93-05 reduces unnecessary EDG starts and that ITS requires a single demonstration of EDG operability within 24 hours. Because Dresden and Quad Cities are maintaining their licensing basis allowable-outage-time (AOT) of seven days for EDG inoperability, the precedence of the Duane Arnold mid-AOT operability demonstration was selected based upon engineering judgement to ensure EDG operability requirements are proved in a periodicity that is consistent to industry standards and reduces unnecessary EDG starts, thus enhancing EDG reliability. The proposed elimination of unnecessary EDG starts (current Technical Specifications require EDG demonstrations every day in this situation) does not significantly reduce existing plant safety margins and enhances EDG reliability and availability

3. CTS 3.9.B.1 for Dresden [power from zero lines] is encompassed within TSUP 3.9.A,

Action 5. The proposed requirements are based on STS 3.8.1.1, Action e. The proposed specification (Action 5) requires that if both offsite power sources are inoperable, the operability of both EDGs shall be demonstrated within 8 hours by performing an unloaded start test unless the EDG's are already operating. In addition, this test must be re-performed approximately midway in the remainder of the AOT. This action is similar to the requirements within the LaSalle County Technical Specifications as modified by recently proposed amendments to the Duane Arnold Technical Specifications. The site is required to restore one offsite line to operable status within 24 hours or be in Hot Shutdown (Mode 3) within the next 12 hours and Cold Shutdown (Mode 4) within the following 24 hours. The site is required to have both offsite lines restored within seven days. Proposed Action 5 is based on the similar provision in the STS and later operating plants and addresses the condition where both of the required offsite lines are inoperable. With both of the required offsite circuits inoperable, sufficient onsite A.C. sources are available to maintain the unit in a safe shutdown condition in case of a design basis transient or accident. The 24 hour allowable outage time provides a period to effect restoration of at least one of the offsite circuits commensurate with the importance of maintaining an A.C. electrical power system capable of meeting its design requirements.

4. CTS 3.9.B.1 for Dresden [core and containment cooling] requires that if there is no power to any offsite line, both EDG's shall be demonstrated OPERABLE, all core and containment cooling systems shall be operable, and the site must notify the NRC within 24 hours. The comparable specification at Quad Cities (3.9.C.2) requires both EDG's to be demonstrated OPERABLE, all core and containment cooling systems to be operable, the power level to be reduced to 40%, and the NRC to be notified within 24 hours. Dresden and Quad Cities Station are adopting from STS a requirement to restore one power source within 24 hours and that the allowable-outage-time of seven days for the other power source is retained at seven days. In addition, the current provisions to notify the NRC staff within 24 hours is being deleted. This deletion is consistent to guidance provided in GL 94-01. The current requirement at Quad Cities to reduce power is based on an assumption that the Main Generator can continue to operate separated from the grid. Additionally, changing the operating condition of the plant with less than a full complement of redundant systems is inconsistent with efforts to reduce challenges to plant safety systems that may occur during plant shutdowns. EDG operability testing is added to be consistent with the STS. The CTS requirements related to core and containment cooling systems is encompassed within proposed TSUP 3.9.A, Action 4. The intent of TSUP 3.9.A, Action 4 is to ensure that for dual train systems that depend upon the EDG as its emergency power supply, if one of the systems in the dual train system is inoperable, the remaining redundant OPERABLE system is only to be considered OPERABLE if its corresponding EDG is also OPERABLE. Otherwise, follow the provisions of the dual train system's LCO (for both trains INOPERABLE) or be in Hot Shutdown within the next 12 hours. The proposed TSUP Action requirements are an enhancement to the clarity of the CTS and are more restrictive because specific actions are required within a two-hour period (the CTS have no such time limitation).

- 5. CTS 3.9.B.1 for Dresden [notify NRC] requires that if there is no power to any offsite line, both EDG's shall be operating, all core and containment cooling systems shall be operable, and the site must notify the NRC within 24 hours. Dresden and Quad Cities are required to comply with the reporting requirements specified in 10 CFR 50.72 and 50.73. The current Technical Specification reporting requirements are redundant to 10 CFR 50.72 and 50.73; therefore, the deletion of these Technical Specification requirements is administrative in nature, is not a reduction in the licensing basis and is inconsequential to existing plant safety margins.
- 6. CTS 3.9.B.2.a for Dresden [1 EDG inoperable] is encompassed within proposed TSUP 3.9.A, Action 2.. TSUP 3.9.A, Action 2 is based on STS 3.8.1.1, Actions. The provisions regarding TSUP 3.9.A Actions in the event one EDG is inoperable have been previously discussed in CTS 3/4.9.B, LCO, Item No. 2 above.
- 7. CTS 3.9.B.2.a for Dresden [2 off-site lines available with 1 EDG inoperable] is encompassed within TSUP 3/4.9.A, Action Statement 3. Proposed Action statement 3 under LCO 3.9.A enhances the clarity of current requirements and is more restrictive than the current licensing basis. The current Technical Specification requirements specify that if one (1) EDG is inoperable than two offsite lines shall be <u>available</u>. The definition of available is not clearly defined and is not as definitive nor restrictive as the TSUP (STS) definition of OPERABLE. The proposed Technical Specifications ensures that plants' vulnerability to a single failure are appropriately addressed. Therefore, the licensing basis is enhanced and the proposed TSUP Action requirements are more restrictive.
- 8. CTS 3.9.B.2.a for Dresden [EDG inoperable for pre-planned maintenance] is encompassed within proposed TSUP 3.4.9.A, Action Statements 2 and 3. Proposed Action statements' 2.b and 3.b under LCO 3.9.A allows an exclusion to demonstrating operability of other AC sources if an EDG is inoperable for preplanned preventive maintenance. STS actions do not provide this exclusionary language. The current Technical Specifications at Dresden and Quad Cities state "If the diesel became inoperable for any cause other than pre-planned preventative maintenance or testing, the operable diesel generator shall be demonstrated operable ..." Therefore, the proposed exclusion is consistent to the CTS that avoids an unnecessary run of an EDG. In addition, this is consistent to the guidance provided in GL 93-05 intended to reduce unnecessary EDG starts. If the plant were to enter pre-planned preventative maintenance or testing and the EDG were not able to meet its intended design function, it would be necessary to declare the EDG inoperable. However, to avoid the unnecessary opposite EDG surveillance run, the physical performance of SR 4.9.A.2.c is not required. As stated in the TSUP Bases, "The term verify as used toward A.C. electrical power sources means to administratively check by examining logs or other information to determine if certain components are out-of-service for pre-planned preventative maintenance, testing, or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate OPERABILITY of the component." Therefore, the purpose of this exclusionary wording is to avoid unnecessary runs of the opposite and operable EDG and is consistent to the CTS at Dresden and Quad Cities

Stations and is consistent to GL 93-05.

- 9. CTS 3.9.B.2.a for Dresden [1 EDG inoperable, test opposite EDG immediately and daily] are encompassed within proposed TSUP 3.9.A, Action 2. The provisions regarding an immediate EDG test have been modified to performing the EDG test within 24 hours. The STS has more stringent requirements of an initial check within one hour and rechecks every 8 hours (STS 3.8.1.1, Action a). The proposed changes ensure that EDG reliability is maintained at Dresden and Quad Cities Stations without compromising EDG availability. The proposed changes are consistent to the requirements outlined in GL 93-05 and the Improved Standard Technical Specifications (ITS NUREG 1433) in that GL 93-05 reduces unnecessary EDG starts and that ITS requires a single demonstration of EDG operability within 24 hours. However, TSUP 3.9.A Action 2 provides additional more restrictive provisions concerning the frequency of verifying the OPERABILITY of the remaining offsite power sources; thus, ensuring the plant's vulnerability to requiring the remaining OPERABLE EDG is limited. Further discussion is provided in CTS 3/4.9.B, LCO, Item No. 2 above.
- 10. CTS 3.9.B.2.b for Dresden does not provide any requirements as it currently only contains the word 'deleted'. Therefore, it has not been retained within the proposed TSUP requirements.
- 11. CTS 3.9.B.2.c for Dresden [1 EDG inoperable, AOT for 7 days if all low pressure core cooling and containment cooling subsystems operable; if not all low pressure core cooling and containment cooling subsystems operable, cold shutdown in 24 hours is encompassed within proposed TSUP 3.9.A, Action 4. Proposed Action 4 under LCO 3.9.A deviates from STS language (STS Section 3.8.1.1, Action c). Proposed TSUP 3.9.A, Action 4 requires the verification of the OPERABILITY of the necessary complement of all required systems and is not limited to the low pressure core cooling and containment cooling subsystems. The proposed Actions continue to ensure the plants are limited in vulnerability to single failure concerns. If the EDG that supports a low pressure core cooling system is inoperable, during DBA conditions, the low pressure core cooling system will be unavailable due to a lack of an emergency power supply. Therefore, the CTS requirements are redundant and conflict with CTS requirements outlined in CTS 3.0.B. In addition, as previously stated, the proposed TSUP Action requirements are an enhancement to the clarity of the CTS and are more restrictive because specific actions are required within a two-hour period (the CTS have no such time requirement). Proposed Action 4 under LCO 3.9.A deviates from STS language (3.8.1.1, Action c). STS Action c requires an OPERABILITY demonstration of all required systems that depend on the remaining OPERABLE EDG. Proposed Action 4 is similar in content to the STS requirement. However, the current requirements at both Dresden and Quad Cities Stations are located in Section 3.0.B of the Technical Specifications. These requirements include offsite power sources and do not specifically address required systems. In addition, there is no interval for performing this verification in current Technical Specification 3.0.B. The intent of TSUP 3.9.A Action 4 is to ensure that for dual train systems

that depend upon the EDG as its emergency power supply, if one of the systems in the dual train system is inoperable, the remaining redundant OPERABLE system is only to be considered OPERABLE if its corresponding EDG is also OPERABLE. Otherwise, follow the provisions of the dual train system's LCO (for both trains INOPERABLE) or be in Hot Shutdown within the next 12 hours. The proposed TSUP Action requirements are an enhancement to the clarity of the CTS and are more restrictive because specific actions are required within a two-hour period (the CTS have no such time limitation).

The proposed specification (Action 4) requires that if one of the EDG's is inoperable, within 2 hours, verify that all required redundant systems, subsystems, trains, components and devices that depend on the remaining operable EDG as a source of emergency power are operable. If these requirements cannot be met for individual items, the unit shall take any required action for both systems, subsystems, trains, components or devices inoperable or be in Hot Shutdown (Mode 3) within 12 hours and Cold Shutdown (Mode 4) within the following 24 hours. This change to the STS is modelled after the Limerick Station Technical Specifications to limit the Action to those systems with redundant components that require the diesel generators as an onsite power source and to allow other appropriate actions for both components out of service if other actions have been previously found acceptable and included in the Technical Specifications. As previously discussed, the current requirements at both Dresden and Quad Cities Station are located in Section 3.0.B of the CTS. These requirements include offsite power sources and do not specifically address required systems. In addition, there is no mentioned interval for performing this check in the CTS.

Proposed TSUP 3/4.9.A, Action 6 is based on the similar North Anna Unit 2 provision. The proposed Action is added to address the condition where both EDGs are inoperable and requires verification of operability of both of the required offsite lines and restoration of one diesel generator within 2 hours or the reactor is required to be shutdown. With one of the required diesel generators returned to service, the provisions of Action 4 are incorporated and both diesel generators are required to be restored to operable status within 7 days from initial loss or the reactor is required to be shutdown. The 7 day allowable outage time is consistent with the demonstrated safety performance provided by the current CTS provisions. Additionally, the provisions of a mid-AOT start test are included similar to the Actions above.

Proposed TSUP 3/4.9.A, Action 7 under LCO 3.9.A deviates from STS language (STS Section 3.8.1.1, Actions f and g) and allows 7 days to restore fuel oil properties, or declare the associated EDG inoperable, at which time another 7 day clock starts. However, there are currently no Technical Specification LCO or action requirements for EDG fuel oil for Dresden and Quad Cities Stations. The proposed TSUP SR 4.9.A.2, note (a) is also consistent to the requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Therefore, there is no reduction in existing plant safety margins by the proposed TSUP Action 7 and SR

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4.9.A.2, note (a) requirements and the CTS are enhanced by the additional Technical Specification surveillance requirement.

- 13. CTS 3.9.B.3 for Dresden [125 VDC/250 VDC 1 battery inoperable, 2 hours to initiate Shutdown] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 14. CTS 3.9.B.4.a for Dresden [250 VDC AOT for 7 days per cycle for maintenance testing] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 15. CTS 3.9.B.4.b for Dresden [if 250 VDC battery needs to be replaced, 7 days to replace] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 16. CTS 3.9.B.4.c for Dresden [125 VDC AOT for 7 days per cycle for testing if alternate battery used] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 17. CTS 3.9.B.4.d for Dresden [125 VDC may allow 1 battery to be inoperable with 1 unit in cold shutdown if alternate battery used] is encompassed within proposed TSUP 3/4.9.D, D.C. Sources Shutdown as Footnote (a). The proposed requirements add additional specific requirements applicable to the 125 VDC system design that ensures appropriate D.C. controls are in place during shutdown modes of operation.
- 18. CTS 3.9.B.4.e for Dresden [if 125 VDC needs to be replaced, 7 days to replace if alternate battery is used] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 19. CTS 3.9.B for Quad Cities [battery operability/applicability requirements] is encompassed within TSUP 3/4.9.C, D.C. Sources - Operating. The proposed applicability implements the present intent of "prior to criticality" and STS guidelines that also includes conditions where the reactor is in the Hot Shutdown condition.

The proposed TSUP Action statements do not include provisions for inoperable

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24/48V batteries or chargers at Quad Cities Station. The aforementioned requirements are included in Dresden TSUP Section 3/4.9.C, D.C. Sources -Operating. The 24/48V battery charger action requirements are included in Dresden TSUP 3.9.C, Action 1. As stated in Attachment 2, Section C.1 of ComEd's March 26, 1993 submittal, the 24/48 volt batteries are only included in the Dresden Technical Specifications due to design differences in the supported equipment. At Quad Cities, no equipment is supported by these batteries which is required for safe shutdown of the units. As described in the UFSAR, SRM and IRM instrumentation are the two systems supported by the Quad Cities 24/48 VDC system. At Dresden, as described in the UFSAR, the 24/48 VDC system supports the analog trip systems, the dP-type scram discharge volume level switches, the signal isolators and the stack gas, radwaste discharge and offgas radiation monitors. Therefore, there is no reduction in the existing plant safety margin at Quad Cities Station by the relocation of controls of the 24/48 battery system to station administrative methods.

#### Surveillance Requirements

- 1. CTS 4.9.B.1 for Quad Cities [weekly batteries SR] has been previously discussed in CTS 3/4.9.A, SR, Item No. 1, above.
- 2. CTS 4.9.B.2 for Quad Cities [every 3 months battery SR] has been previously discussed in CTS 3/4.9.A, SR, Item No. 2, above.
- 3. CTS 4.9.B.3 for Quad Cities [operating cycle battery SR] has been previously discussed in CTS 3/4.9.A, SR, Item No. 3, above.
- 4. CTS 4.9.B.4 for Quad Cities [60 month battery SR] has been previously discussed in CTS 3/4.9.A, SR, Item No. 4, above.
- 5. CTS 4.9.B.5 for Quad Cities [service battery SR] has been previously discussed in CTS 3/4.9.A, SR, Item No. 5, above.
- 6. CTS 4.9.B.6 for Quad Cities [alternate 125 VDC operability requirements] has been previously discussed in CTS 3/4.9.A, SR, Item No. 6, above.

#### <u>CTS 3/4.9.C</u>

#### **Applicability**

1. The applicability of CTS 3/4.9.C for Quad Cities in encompassed within TSUP 3.9.A, Applicability. This has been previously discussed in CTS 3/4.9.A, Applicability, above. The applicability of CTS 3/4.9.C is implied to also be encompassed within TSUP 3.9.A and TSUP 3/4.9.B as CTS 3/4.9.C for Dresden is related to EDG fuel oil which supports the operability of the EDG. Such requirements are discussed in CTS 3/4.9.D, LCO, Item no. 1.

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#### Limiting Conditions for Operation (LCO)

- 1. CTS 3.9.C for Dresden [quality/quantity of diesel fuel] in encompassed within TSUP 4.9.A.5 and the LCO for TSUP 3.9.A. Proposed SR 4.9.A.5 requires water and sediment testing of the EDG fuel oil. In addition, proposed SR 4.9.A.5 allows the addition of new fuel oil to the storage tanks before all required tests being complete (specifically viscosity). Water and sediment testing is performed in accordance with ASTM D1796 and the visual test for free water and particulate contamination (clear and bright) is performed in accordance with ASTM D4176. Parameter limits are in accordance with ASTM D975 for water and sediment and ASTM D4176 for "clear and bright." The specific revision in use for each of these standards is administratively controlled by station procedures. The CTS requirements do not provide any specific acceptance criteria or guidance with respect to EDG fuel oil quality. The CTS require the monthly logging of the quantity of fuel and the monthly checking of the EDG fuel oil quality - no specific acceptance criteria are listed. The time-period proposed in TSUP is acceptable because the fuel-oil properties of interest, even if they were not within stated limits, would not have an immediate effect on EDG operation. For the same reason, should one or more of these properties not be within limits, there is no need to declare the EDG inoperable. It is acceptable to continue unit operation for up to 31 days while measures are taken to ensure that the properties of the mixed fuel oil are within limits or that the fuel-oil properties are being restored to within limits. If after continued operation for 31 days the properties of the mixed fuel oil are still not within limits, the EDG shall be declared inoperable. TSUP SR 4.9.A.5 meets the intentions of the restrictions specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433) and the proposed changes enhance existing plant safety margins. The details of the methods for performing the EDG fuel oil Surveillances are not necessary for inclusion in the Technical Specifications. These details are adequately controlled by procedures and their revisions are adequately controlled by the provisions of 10 CFR 50.59. Proposed TSUP SR 4.9.A for fuel oil tests is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). There is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A requirements for fuel oil. The basis for footnote (i) in the Quad Cities TSUP 4.9.A.5 is to delineate that Fuel Oil No. 1 is excluded from the particulate surveillance. The current Quad Cities Technical Specifications have no acceptance criteria with respect to fuel oil. Such requirements are administratively controlled through station procedures.
- 2. CTS 3.9.C for Quad Cities [general applicability] provides information to support the applicability of CTS 3/4.9.A and CTS 3/4.9.B. The applicability is specified as whenever the reactor is in the Run mode or for startup from a hot shutdown condition. Such requirements are encompassed within proposed TSUP 3/4.9.A, Applicability and 3/4.9.C, Applicability, as previously discussed.
- 3. CTS 3.9.C.1 for Quad Cities [AOT of 7 days with 1 offsite line inoperable] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 2, above.

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ComEd TSUP RAI Response

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- 4. CTS 3.9.C.1 for Quad Cities [available] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 7, above.
- 5. CTS 3.9.C.2 for Quad Cities [actions during LOOP] has been previously discussed in CTS 3/4.9, LCO, Item Nos. 3, 4 and 5, above.
- 6. CTS 3.9.C.2 for Quad Cities [all core and containment cooling systems operable] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 4, above.
- 7. CTS 3.9.C.2 for Quad Cities includes requirements to reduce power to less than 40% in the event no power is available to any off-site line. The current requirement at Quad Cities to reduce power is based on an assumption that the Main Generator can continue to operate separated from the grid. Additionally, changing the operating condition of the plant with less than a full complement of redundant systems is inconsistent with efforts to reduce challenges to plant safety systems that may occur during plant shutdowns. EDG operability testing is added to be consistent with the STS.
- 8. CTS 3.9.C.2 for Quad Cities [reports to NRC during LOOP] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 5, above.
- 9. CTS 3.9.C.3 for Quad Cities [125 VDC/250 VDC 1 battery inoperable, 3 days to initiate shutdown] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 10. CTS 3.9.C.3.a for Quad Cities [125 VDC AOT for 7 days per cycle for testing if alternate battery used] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.
- 11. CTS 3.9.C.3.b for Quad Cities [125 VDC may allow 1 battery to be inoperable with 1 unit in cold shutdown if alternate battery used] is encompassed within proposed TSUP 3/4.9.D, D.C. Sources Shutdown as Footnote (a). The proposed requirements add additional specific requirements applicable to the 125 VDC system design that ensures appropriate D.C. controls are in place during shutdown modes of operation.
- 12. CTS 3.9.C.3.c for Quad Cities [if 125 VDC needs to be replaced, 7 days to replace if alternate battery is used] was not retained in the proposed requirements. ComEd will revise the requirements to be consistent or more conservative than existing Technical Specification requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.

#### Surveillance Requirements

- 1. CTS 4.9.C for Dresden [quality/quantity of diesel fuel] in encompassed within TSUP 4.9.A.5 and the LCO for TSUP 3.9.A. Proposed SR 4.9.A.5 requires water and sediment testing of the EDG fuel oil. In addition, proposed SR 4.9.A.5 allows the addition of new fuel oil to the storage tanks before all required tests being complete (specifically viscosity). Water and sediment testing is performed in accordance with ASTM D1796 and the visual test for free water and particulate contamination (clear and bright) is performed in accordance with ASTM D4176. Parameter limits are in accordance with ASTM D975 for water and sediment and ASTM D4176 for "clear and bright." The specific revision in use for each of these standards is administratively controlled by station procedures. The CTS requirements do not provide any specific acceptance criteria or guidance with respect to EDG fuel oil guality. The CTS require the monthly logging of the quantity of fuel and the monthly checking of the EDG fuel oil quality - no specific acceptance criteria are listed. The time-period proposed in TSUP is acceptable because the fuel-oil properties of interest, even if they were not within stated limits, would not have an immediate effect on EDG operation. For the same reason, should one or more of these properties not be within limits, there is no need to declare the EDG inoperable. It is acceptable to continue unit operation for up to 31 days while measures are taken to ensure that the properties of the mixed fuel oil are within limits or that the fuel-oil properties are being restored to within limits. If after continued operation for 31 days the properties of the mixed fuel oil are still not within limits, the EDG shall be declared inoperable. TSUP SR 4.9.A.5 meets the intentions of the restrictions specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433) and the proposed changes enhance existing plant safety margins. The details of the methods for performing the EDG fuel oil Surveillances are not necessary for inclusion in the Technical Specifications. These details are adequately controlled by procedures and their revisions are adequately controlled by the provisions of 10 CFR 50.59. Proposed TSUP SR 4.9.A for fuel oil tests is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). There is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A requirements for fuel oil. The basis for footnote (i) in the Quad Cities TSUP 4.9.A.5 is to delineate that Fuel Oil No. 1 is excluded from the particulate surveillance. The current Quad Cities Technical Specifications have no acceptance criteria with respect to fuel oil. Such requirements are administratively controlled through station procedures.
- 2. CTS 4.9.C for Quad Cities [check of availability of electric power daily] has been encompassed within proposed TSUP 4.9.A.1. The proposed surveillance frequency has been changed from a daily check of status to a verification of OPERABILITY every seven days. CTS 4.9.C for Quad Cities requires checking of the availability of electric power on a daily basis. Proposed TSUP 4.9.A.1.a specifies a verification of the OPERABILITY of this every seven days. Although the proposed amendment reduces the periodicity of the surveillance, current requirements are vague and provide little guidance to site operating personnel regarding the disposition of OPERABILITY of the equipment (a status check of the equipment is all that is specified). The proposed

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TSUP requirements provide more specific details, thus ensuring equipment OPERABILITY can be properly dispositioned. The proposed requirements have been shown to be acceptable based upon industry experience for similar equipment consistent in design to Dresden and Quad Cities Stations. Therefore, the proposed Surveillance Requirements provide enhanced OPERABILITY requirements for the offsite transmission distribution network, the relaxation in periodicity does not significantly reduce existing plant safety margins.

#### <u>CTS 3/4.9.D</u>

#### Applicability

The applicability of CTS 3.9.D is specified in the proposed Applicability of TSUP 3.9.B that includes those conditions of the present Technical Specifications since the specification is applicable during all operations in Cold Shutdown and Refueling. TSUP 3.9.B, Applicability is consistent to the applicability discussed in Dresden CTS 3.9.D for EDG requirements.

#### Limiting Conditions for Operation (LCO)

- 1. CTS 3.9.D for Dresden [CSD Refueling EDG requirements] is encompassed within TSUP 3/4.9.B. Proposed TSUP Section 3/4.9.B, "AC Sources - Shutdown," incorporates the requirements of the STS Section 3/4.8.1.2. Plant specific values for the listed parameters are included to be consistent to the safety analysis for the plant. Proposed Actions, Applicability, Surveillance Requirements and corresponding surveillance frequencies, are changed to match STS guidelines and format, where appropriate. ComEd, therefore, finds the proposed changes acceptable. Deviations from STS and current Technical Specification requirements, where applicable are discussed below.
- 2. As a further clarification to CTS 3.9.D for Dresden, the proposed Applicability of TSUP 3.9.B includes those conditions of the present Technical Specifications since the specification is applicable during all operations in Cold Shutdown and Refueling. A proposed Action is included from STS guidelines since no present provisions exist. The proposed Action requires that with less than the required A.C. electrical power sources operable, core alterations and handling of irradiated fuel in the secondary containment are suspended, operations with a potential to drain the reactor vessel and crane operations over the spent fuel storage pool when fuel assemblies are stored therein are stopped. In addition, the proposed Action requires that during Refueling conditions with a reduced water level in the spent fuel storage pool, corrective action is required immediately to restore the required power sources to operable status when practical. Proposed SR 4.9.B references the SRs in 4.9.A as required testing for the operable A.C. Sources.
- 3. As a further clarification to CTS 3.9.D for Dresden, proposed SR 4.9.B requires following SR 4.9.A except 4.9.A.2.d. This exception deviates from STS requirements. TSUP 4.9.A.2.d is equivalent to STS 4.8.1.1.2.a.5. Proposed TSUP SR 4.9.B is

equivalent to STS SR 4.8.1.2. TSUP SR 4.9.B requires A.C. Source operability to be determined by the performance of all surveillances encompassed within TSUP SR 4.9.A (i.e., 4.9.A.1, 4.9.A.2, 4.9.A.3, 4.9.A.4, 4.9.A.5, 4.9.A.6, 4.9.A.7, 4.9.A.8, 4.9.A.9 and 4.9.A.10) except SR 4.9.A.2.d (EDG paralled to offsite power). This exception (the only required EDG and the only required offsite circuit connected) presents a risk of a single fault resulting in a station blackout. The exception does not take exception to the requirement for the EDG to be capable of performing the particular function; just to the requirement to demonstrate it while that source of power is being relied upon to support meeting the LCO.

4. CTS 3.9.D for Quad Cities related to EDG fuel oil quantity has been previously discussed in CTS 3/4.9.C, LCO, Item No. 1 and CTS 3/4.9.C, SR, Item No. 1, above.

# Surveillance Requirements

- 1. CTS 4.9.D.1.a for Dresden [monthly EDG start test] has been previously discussed in CTS 3/4.9.A, SR, Item No. 7, above.
- 2. CTS 4.9.D.1.b for Dresden [monthly EDG load test] has been previously discussed in CTS 3/4.9.A, SR, Item No. 8, above.
- 3. CTS 4.9.D.2 for Dresden [monthly EDG air compressor checks] has been previously discussed in CTS 3/4.9.A, SR, Item No. 9, above.
- 4. CTS 4.9.D.3 for Dresden [monthly EDG fuel transfer check] has been previously discussed in CTS 3/4.9.A, SR, Item No. 10, above.
- 5. CTS 4.9.D.4 for Dresden [refuel SR EDG LOOP test] is encompassed within proposed TSUP 4.9.A.8.f. TSUP 4.9.A.8.f is based on STS 4.8.1.1.2.e.7. The proposed TSUP requirements provide more specific acceptance criteria which will ensure site operations personnel can determine as acceptable level of EDG performance. Proposed surveillance SR 4.9.A.8 is based on STS with some minor modifications to account for plant design. The full load reject testing, proposed 4.9.A.8.c, is identified as such rather than providing a specific value of loading to prevent requiring artificial loading that would increase the probability of a loss of offsite power while conducting the test. The limit of 5000 volts is based on consistency with the format of the LaSalle Technical Specifications. For the loss of offsite power demonstration, proposed 4.9.A.8.d.2, loading is not performed through a sequencer at Dresden and Quad Cities and the proposed surveillance is appropriately modified. STS SR 4.8.1.1.2.e.6 is not used per Generic Letter 83-30. STS SR 4.8.1.1.2.e.12, 13 and 14 are not included in the station designs and are not proposed for inclusion. STS SR 4.8.1.1.2.e.16 is also not proposed since this demonstration is redundant and encompassed with other tests particularly with proposed 4.9.A.8.g. The proposed changes do not reduce existing plant safety margins.
- 6. CTS 4.9.D for Quad Cities [monthly EDG fuel quantity logging and quality check] has

been previously discussed in CTS 3/4.9.C, LCO, Item No. 1 and CTS 3/4.9.C, SR, Item No. 1, above

# CTS 3/4.9.E Diesel Generator Operability (Quad Cities)

# Applicability

1. The applicability of CTS 3/4.9.E for Quad Cities in encompassed within TSUP 3.9.A, Applicability. This has been previously discussed in CTS 3/4.9.A, Applicability, above.

# Limiting Conditions for Operation (LCO)

- 1. CTS 3.9.E.1 for Quad Cities [unit or shared EDG AOT] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 6, above.
- 2. CTS 3.9.E.1 for Quad Cities [EDG AOT w/LP CS & RHR & 2 offsite lines available] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 7, above.
- 3. CTS 3.9.E.1 for Quad Cities [EDG inoperable due to maintenance or testing] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 8, above.
- 4. CTS 3.9.E.1 for Quad Cities [1 EDG inoperable, test other EDG immediately and daily] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 9, above.
- 5. CTS 3.9.E.1 for Quad Cities [if cannot return 1 inoperable EDG, Cold Shutdown in 24 hrs] has been previously discussed in CTS 3/4.9.B, LCO, Item No. 11, above.
- 6. CTS 3.9.E.2 for Quad Cities does not provide any requirements as it currently only contains the word 'deleted'. Therefore, it has not been retained within the proposed TSUP requirements.
- 7. CTS 3.9.E.3 for Quad Cities [Cold Shutdown Refueling EDG requirements] has been previously discussed in CTS 3/4.9.D, LCO, Item Nos. 1, 2 and 3, above.

#### Surveillance Requirements

- 1. CTS 4.9.E.1 for Quad Cities does not provide any requirements as it currently only contains the word 'deleted'. Therefore, it has not been retained within the proposed TSUP requirements.
- 2. CTS 4.9.E.2.a for Quad Cities and CTS 4.9.E.2.b for Quad Cities [EDG load shed test] has been previously discussed in CTS 3/4.9.D, SR, Item No. 5, above.

# <u>CTS 3/4.9.F Reactor Protection Bus Power Monitoring System (Quad Cities)</u> <u>CTS 3/4.1.A.3, 4 and 5 (Dresden)</u>

#### **Applicability**

1. See below.

# Limiting Conditions for Operation (LCO)

- CTS 3.9.F.1 for Quad Cities and CTS 3.1.A.3 for Dresden [LCO] is encompassed within proposed TSUP 3.9.G. TSUP 3/4.9.G is based on STS 3/4.8.4.4 as modified by GL 91-09. Plant specific values for the listed parameters are included to be consistent to the safety analysis for the plant. Proposed Actions, Applicability, Surveillance Requirements and corresponding surveillance frequencies, are changed to match STS guidelines and format, where appropriate.
- 2. CTS 3.9.F.1 for Quad Cities and CTS 3.1.A.3 for Dresden [applicability QCS exception during SHUTDOWN mode, DNPS - all times] is encompassed within proposed TSUP 3/4.9.G. Proposed Specification 3/4.9.G is adopted from STS and Generic Letter 91-09 with the exception of the applicability in Operational Mode 4. The applicability in this mode is restricted in accordance with previously approved revisions for Perry Nuclear Power Plant. Current Specification 3/4.9.F at Quad Cities and 3/4.1.A.3, 4 and 5 at Dresden, Reactor Protection Bus Power Monitoring System, is rewritten as proposed Specification 3.9.G/4.9.G for both Dresden and Quad Cities. Proposed operability 3.9.G.1 is taken from present provisions that require two RPS electric power monitoring channels for each inservice RPS MG set or alternate power source. Current applicability of all conditions except Shutdown is replaced at Quad Cities and at all times at Dresden Station, with provisions for all operational modes except one condition that has been previously approved at Perry Nuclear Power Station. Proposed exceptions to the STS "at all times" would be when no fuel is in the reactor vessel in accordance with proposed Table 1-2 and when no control rods are withdrawn in Operational Mode 4, Cold Shutdown. The proposed change ensures that when a RPS MG set or alternate power source is in operation, proper controls over frequency and voltage are maintained and reactor vessel reactivity concerns are addressed by the requirement of all control rods being inserted. The current Action provisions are retained since they are consistent with the Standard Technical Specifications.

Where there is no fuel in the reactor vessel, the reactor is considered not to be in any OPERATIONAL MODE, as defined in Table Notation (f) to TSUP Table 1-2. Therefore, TSUP LCO 3.9.G does not apply. When there is no fuel in the vessel, it is not necessary or required to have an operable RPS, and therefore an operable RPS Power Monitoring system is not required.

Footnote (a) in TSUP states "With any control rod withdrawn." not "When no control rods are withdrawn." The difference is outlined as follows - TSUP LCO 3.9.G requires

the operability of two (2) RPS electric power monitoring channels for each RPS MG set or alternate power supplies during Cold Shutdown conditions (Mode 4 as defined in TSUP Table 1-2) with any control rod withdrawn. During Mode 4, the RPS Power Monitoring system is required to be operable if control rods are withdrawn. If rods are not withdrawn during Mode 4 conditions, then the requirements of the RPS Power Monitoring system are not required to support the safe operation of the plant. This is also consistent to the current licensing basis of the plant.

The proposed TSUP Applicability requirements are more restrictive than the current licensing basis at Quad Cities because the RPS Power Monitoring system is not required to be operable during all shutdown conditions. There are no qualifiers further specifying when those requirements should be clarified. TSUP allows the RPS Power Monitoring system to be inoperable during Cold Shutdown conditions but requires all control rods to be inserted. Therefore, the existing safety margins are not adversely affected.

- 3. CTS 3.9.F.2.a for Quad Cities and CTS 3.1.A.4 for Dresden [AOT with 1 RPS inoperable] is encompassed within proposed TSUP 3.9.G, Action 1. The proposed requirements are equivalent to the CTS.
- 4. CTS 3.9.F.2.b for Quad Cities and CTS 3.1.A.5 for Dresden [AOT with 2 RPS inoperable] is encompassed within proposed TSUP 3.9.G, Action 2. The proposed requirements are equivalent to the CTS.

#### Surveillance Requirements

- 1. CTS 4.9.F.1 for Quad Cities and CTS 4.1.A.3 for Dresden [operability] is encompassed within proposed TSUP 4.9.G. TSUP 3/4.9.G is based on STS 3/4.8.4.4 as modified by GL 91-09. Plant specific values for the listed parameters are included to be consistent to the safety analysis for the plant. Proposed Actions, Applicability, Surveillance Requirements and corresponding surveillance frequencies, are changed to match STS guidelines and format, where appropriate.
- 2. CTS 4.9.F.1.a for Quad Cities and CTS 4.1.A.3.a for Dresden [CFT requirements] is encompassed within proposed TSUP 4.9.G.1. The proposed requirements are equivalent to the CTS. Generic Letter 91-01 recommended an alterative testing method as compared to testing during power operations. This has been implemented at some later operating BWRs and Dresden and Quad Cities Stations and has been shown to provide adequate assurance of system operability. The proposed requirements are consistent to the current licensing basis at both Dresden and Quad Cities. At the time of the submittal of TSUP 3/4.9 (P. Piet letter to T. Murley, dated March 26, 1993), this was not so for Quad Cities. Generic Letter 91-09 was used as the basis for Amendment Nos. 142/137 approved by the NRC staff for Quad Cities on May 28, 1993. It should be noted that these requirements were previously approved for Dresden.

- 3. CTS 4.9.F.1.b for Quad Cities and CTS 4.1.A.3.b for Dresden [channel calibration] is encompassed within proposed TSUP 4.9.G.2. The term operating cycle has been conservatively replaced by proposed TSUP surveillance frequency of every 18 months which provides a uniform, constant surveillance frequency. The proposed TSUP requirements are consistent to industry standards which have been demonstrated to provide adequate assurance of maintaining battery operability. The current requirements are vague and do not provide a closed-end SR frequency (the definition in the CTS for operating cycle is open-ended).
- 4. CTS 4.9.F.1.b for Quad Cities and CTS 4.1.A.3.b for Dresden [bus specifics] is encompassed within proposed TSUP 4.9.G.2. The proposed requirements are equivalent to the CTS.

Response to RAI Questions for TSUP Section 3/4.9

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1. Proposed Action statements 1.b and 2.b under LCO 3.9.A requires demonstrating emergency diesel generator (EDG) operability within 24 hours of losing one source of off-site power (if not successfully proven within the past 24 hours), with a recheck within 72 hours. The STS has more stringent requirements of an initial check within one hour and rechecks every 24 hours. There is no justification given for changing the initial check to within 24 hours (or no check if previously performed), and the justification given for the mid-allowable outage time (AOT) check does not explain why a similar requested change for Duane Arnold applies to Dresden and Quad Cities.

Response - The proposed changes ensure that EDG reliability is maintained at Dresden and Quad Cities Stations without compromising EDG availability. The proposed changes are consistent to the requirements outlined in the Improved Standard Technical Specifications (ITS - NUREG - 1433) in that ITS requires a single demonstration of EDG operability within 24 hours. Because Dresden and Quad Cities are maintaining their current licensing basis allowed-outage-time (AOT) of seven days for EDG inoperability, the precedence of the Duane Arnold mid-AOT operability demonstration was selected based upon engineering judgement to ensure EDG operability requirements are demonstrated in a periodicity that is consistent to industry standards and reduces unnecessary EDG starts, thus enhancing EDG reliability. There changes are consistent to the intent of Generic Letter (GL) 93-05. Therefore, ComEd concluded that the proposed elimination of unnecessary EDG starts does not significantly reduce existing plant safety margins and enhances EDG reliability and availability, the proposed TSUP Action statements are conservative and are therefore acceptable.

2. Proposed Action statements 2.b and 3.b under LCO 3.9.A allows an exclusion to demonstrating operability of other AC sources if an EDG is inoperable for preplanned preventive maintenance without any justification for the exception. This exception is neither currently authorized nor allowed under STS. This would potentially allow operation without the required off-site and on-site AC power sources for a week without having to demonstrate operability of any of the remaining sources, as long as the maintenance was planned, which is not a conservative Action. Provide justification for this relaxation of the current TSs.

Response - CTS 3.9.E.1 for Quad Cities and CTS 3.9.B.2.a for Dresden does specify requirements for pre-planned preventive maintenance to exclude unnecessary EDG runs. Administrative checks are performed in lieu of OPERABILITY demonstrations when the EDG is made inoperable for preplanned preventive maintenance. The proposed changes ensure that EDG reliability is maintained at Dresden and Quad Cities Stations without compromising EDG availability. The proposed changes are consistent to the requirements outlined in the Improved Standard Technical Specifications (ITS - NUREG - 1433) in that ITS requires a single demonstration of EDG operability within 24 hours. Because Dresden and Quad Cities are maintaining their current licensing basis allowed-outage-time (AOT) of seven
days for EDG inoperability, the precedence of the Duane Arnold mid-AOT operability demonstration was selected based upon engineering judgement to ensure EDG operability requirements are demonstrated in a periodicity that is consistent to industry standards and reduces unnecessary EDG starts, thus enhancing EDG reliability. There changes are consistent to the intent of Generic Letter (GL) 93-05. Therefore, ComEd concluded that the proposed elimination of unnecessary EDG starts does not significantly reduce existing plant safety margins and enhances EDG reliability and availability, the proposed TSUP Action statements are conservative and are therefore acceptable.

3. Similar to the questions above, proposed Action statement 3.b under LCO 3.9.A has similar unjustified relaxations for operability determinations for EDGs.

#### Response - See ComEd response to TSUP Section 3/4.9 Question No. 1 above.

4. Proposed Action statement 3 under LCO 3.9.A allows a relaxation of current requirements in that it would allow continued operation with one EDG and one off-site AC power source inoperable, when this condition is not currently allowed for these sites. No justification is provided as to why this condition would be acceptably safe for these specific sites.

Response - The proposed TSUP action statement enhances the clarity of current requirements and is more restrictive than the current licensing basis. The current Technical Specification requirements specify that if one (1) EDG is inoperable than two offsite lines shall be <u>available</u>. The definition of available is not clearly defined and is not as definitive nor restrictive as the TSUP (STS) definition of OPERABLE. The proposed Technical Specifications ensures that plants' vulnerability to a single failure are appropriately addressed. Because the current licensing basis is enhanced and the proposed TSUP Action requirements are more restrictive, the proposed TSUP Actions are acceptable.

5. Proposed Action statement 4.a under LCO 3.9.A is not worded so as to meet the intent of STS 3.8.1.1.c or as described in attachment 2 paragraph 12. Also, justification that a requirement used at Limerick is appropriate for use at Dresden and Quad Cities is required.

Response - As stated in Note A.13 in Attachment 2, the current requirements at both Dresden and Quad Cities Stations are located in Section 3.0.B of the Technical Specifications. These requirements include offsite power sources and do not specifically address required systems. In addition, there is no time interval for performing this verification. The intent of TSUP 3.9.A Action 4 is to ensure that for dual train systems that depend upon the EDG as its emergency power supply, if one of the systems in the dual train system is inoperable, the remaining OPERABLE system is only to be considered OPERABLE if its corresponding EDG is also OPERABLE. Otherwise, follow

the provisions of the dual train system's LCO (for both trains INOPERABLE) or be in Hot Shutdown within the next 12 hours. The proposed TSUP Action requirements are an enhancement to the clarity of the current licensing basis and are more restrictive because specific actions are required within a two hour time frame (the current Technical Specifications have no such time requirement). Because the proposed changes are more conservative and consistent to the current licensing basis, the proposed Action requirements are acceptable.

- 6. Proposed Action statements 5 and 6.b under LCO 3.9.A have the following problems:
  - a. It eliminates current requirements to ensure all core and containment cooling systems are operable without justification for this relaxation.
  - b. It changes the operability check time requirements for the EDGs in the same manner as discussed above in comment 3 without justification.

**Response - TSUP 3.9.A, Action 4 requires the verification of the OPERABILITY** of the necessary complement of all ECCS systems and is not limited to the low pressure core cooling and containment cooling subsystems. Proposed TSUP 3/4.5 contains the requirements for ECCS. The proposed Actions continue to ensure the plants are limited in vulnerability to single failure concerns. If the EDG that supports a low pressure core cooling system is inoperable, during DBA conditions, the low pressure core cooling system will be unavailable due to a lack of an emergency power supply. Therefore, the current Technical Specification requirements are redundant and conflict with current Technical Specification requirements outlined in 3.0.B. In addition, as previously stated, the proposed TSUP Action requirements are an enhancement to the clarity of the current licensing basis and are more restrictive because specific actions are required within a two hour time frame (the current Technical Specifications have no such time requirement). Because the proposed changes are more conservative and consistent to the current licensing basis, the proposed Action requirements are acceptable.

# For Question No. 6.b, see ComEd response to TSUP Section 3/4.9 Question No. 3 above.

7. Proposed Action statement 7 under LCO 3.9.A allows 7 days to restore fuel oil properties, or declare the associated EDG inoperable, at which time another 7 day clock starts; all this is after a 31 day period allowed for analyzing the oil sample. This does not appear conservative, particularly if the fuel oil properties are such that they will not actually support running the associated EDG. This Action is not currently allowed at either station or in the STS, and would constitute a relaxation of requirements. Site-specific justification is required for this item.

#### Response - There are currently no specific detailed LCO requirements for

EDG fuel oil. Proposed TSUP 3.9.A, Action 7 is consistent to the Action statements specified in the Perry Station Technical Specifications. The proposed time-period is acceptable because the fuel-oil properties of interest, even if they were not within stated limits, would not have an immediate effect on EDG operation. For the same reason, should one or more of the EDG fuel oil properties not be within limits, there is no need to declare the EDG inoperable. Is acceptable to continue operation for up to 31 days while measures are taken to ensure that the properties of the mixed fuel oil are within limits or that the fuel-oil properties are being restored to within limits. If after continued operation the properties of the mixed fuel oil are still not within limits, the EDG shall be declared inoperable. There is no reduction in existing plant safety margins by the proposed TSUP 3.9.A, Action 7 requirements and the current licensing basis is enhanced by the additional Technical Specification surveillance requirement associated with EDG fuel oil.

8. Proposed Action statement 8 under LCO 3.9.A specifies a report to the NRC in accordance with specification 6.6.B.4, which in turn refers to a table which contains nothing to do with diesels. Either the reference needs correcting, or the table needs updating to include the problem diesel category.

Response - The content of the aforementioned sections is equivalent to STS Section 6.9.2 "Special Reports." STS Section 6.9.2 which is estimated for inclusion in TSUP Section 6.9.B "Special Reports" has not yet been submitted to the NRC staff. In addition, GL 94-01 deletes special reporting Technical Specifications and encompasses such requirements under the auspices of 10 CFR 50.72 and 50.73. This should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.

9. Proposed Action statement 8 under LCO 3.9.A requests changes to conform to draft revision 3 to Regulatory Guide 1.9 (which is still a draft), without regard to the more recent NRC discussion in Generic Letter (GL) 94-01. As that GL was issued more recently than the current submission for license amendment, do Dresden and Quad Cities intend to apply for amendments as allowed under the GL?

#### **Response - ComEd will pursue changes to the requirements consistent to GL** 94-01 as a TSUP clean-up item, if applicable.

10. Proposed Surveillance Requirement (SR) 4.9.A.1.b does not include testing the automatic transfer feature which is tested in the STS SR 8.1.1.1.b. The justification given in attachment 2 is confusing and does not appear to explain not incorporating the whole SR.

Response - ComEd agrees that Attachment 2 for this issue is unclear. The automatic feature discussed in STS 4.8.1.1.1.b is not consistent to the system design at Dresden and Quad Cities Stations. Therefore, the automatic transfer capability surveillance was not included in TSUP 4.9.A.1.b. Because

the proposed TSUP package is consistent or more conservative than the current licensing basis (there are no current Technical Specification surveillances governing the manual transfer from the normal to the alternate circuit), it is therefore acceptable.

11. Proposed SR 4.9.A.2 has associated proposed note "a" which states: "All planned diesel generator tests shall be conducted in accordance with manufacturer's recommendations regarding engine prelube, leak detection and warmup procedures, and as applicable regarding loading and shutdown recommendations." This is not correct. Per draft revision 3 to Regulatory Guide 1.9, GL 84-15 and STSs, some EDG surveillance are to be performed from ambient conditions in order to verify that the design basis for rapid backup power availability is met.

Response - EDG starts without prior engine prelube create unnecessary engine wear, thereby reducing overall EDG reliability. The engine prelube does not result in an enhanced start performance that could mask the engine's ability to start in accident conditions without a prelube. Therefore, the prelube allowance is included for all SRs requiring an EDG start. In addition, the proposed requirements are consistent or more restrictive than the current licensing basis. Proposed TSUP SR 4.9.A.2, note (a) is also consistent to the requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A.2, note (a) requirements and the current licensing basis is enhanced by the additional Technical Specification surveillance requirement, the proposed changes are therefore acceptable.

12. Proposed SRs 4.9.A.2.c and 4.9.A.7.a state that the EDG should start and "...accelerate to synchronous speed..." Synchronous speed is a term which applies to electric motors and generators, not engines; synchronous speed is a comparison between the speed of the field to the armature, while the desired engine speed is a function of the desired electrical frequency and the design of the generator.

Response - The requirement to obtain a specified minimum speed (rpm) is redundant to the requirement to obtain the specified frequency (Hz) range since the minimum frequency range is at the same point. In addition, the proposed requirements are consistent or more restrictive than the current licensing basis. Proposed TSUP SR 4.9.A.2.c and 4.9.A.7.a is also consistent to the requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A.2.c and 4.9.A.7.a requirements and the current licensing basis is enhanced by the additional Technical Specification surveillance requirements, the proposed changes are therefore acceptable.

13. Proposed SR 4.9.A.2.f allows taking one EDG starting air receiver tank out of service. This is not currently allowed, nor is it allowed in the STS. This represents

a relaxation in requirements, and is not adequately justified.

Response - The current Technical Specifications do not provide an LCO for EDG starting air tanks. The current Technical Specifications requirements specify that the EDG starting air compressor shall be checked for operation and its ability to recharge air receivers. As stated in Note A.22 of Attachment 2, the proposed specifications allow redundant air receiver system components to be out-of-service since the proposed specifications meet the design function of the system. TSUP SR 4.9.A.2.f is more restrictive than the current Technical Specifications as it provides an acceptance limit to which the EDG starting air receiver tanks must achieve. The current Technical Specification requirements do not specify operability criteria. Because the proposed requirements are more restrictive than the current licensing basis and provide enhanced guidance to site operating personnel, the proposed changes increase existing plant safety margins and are therefore acceptable.

14. A note appears at the bottom of the center column of page 10/32 and several subsequent pages of the change matrix, below SR 4.9.A.4, which is not explained. It appears this note is only applied to Quad Cities, but it is not currently in that TS. An explanation of its origin and the need to exclude the tank should be provided.

Response - ComEd agrees with the NRC staff's statements. The basis of footnote (i) in the Quad Cities TSUP package is to delineate that Fuel Oil No. 1 is excluded from the particulate surveillance. The current Quad Cities Technical Specifications have no acceptance criteria delineated with respect to fuel oil. Such requirements are administratively controlled via ownercontrolled documents. The proposed TSUP surveillance is consistent or more conservative to the current licensing basis and is therefore acceptable.

15. The order of the notes in section 3/4.9 is jumbled. Alphabetical order should be restored and letter gaps eliminated.

Response - This should be left as an open item, contingent upon its implementation and correction, if applicable, in the TSUP clean-up package.

16. Proposed SR 4.9.A.5 requires water and sediment checks twice.

Response - As noted in the TSUP Bases for 3/4.9.A, water and sediment testing is in accordance with ASTM D1796 and the visual test for free water and particulate contamination (clear and bright) is in accordance with ASTM D4176. Parameter limits are in accordance with ASTM D975 for water and sediment and ASTM D4176 for "clear and bright." The specific revision in use for each of these standards is controlled by station procedures.

17. Proposed SR 4.9.A.5 allows the addition of new fuel oil to the storage tanks prior to all required tests being complete, specifically viscosity. This is a relaxation of current requirements in that it could lead to contaminating the fuel supply without

knowing it for a month. The STS bases for this section do not discuss the sampling of fuel oil, but the improved technical specifications (ITS) bases clearly indicate all tests are to be completed prior to the addition of new fuel oil to the storage tanks.

Response - The current Technical Specification requirements do not provide any acceptance criteria or guidance with respect to EDG fuel oil quality. The current Technical Specifications require the monthly logging of the quantity of fuel and the monthly checking of the EDG fuel oil quality - no specific acceptance criteria are listed.

The proposed time-period is acceptable because the fuel-oil properties of interest, even if they were not within stated limits, would not have an immediate effect on EDG operation. For the same reason, should one or more of these properties not be within limits, there is no need to declare the EDG inoperable. Is acceptable to continue operation for up to 31 days while measures are taken to ensure that the properties of the mixed fuel oil are within limits or that the fuel-oil properties are being restored to within limits. If after continued operation the properties of the mixed fuel oil are still not within limits, the EDG shall be declared inoperable. Although TSUP SR 4.9.A.5 does not clearly require the same restrictions as specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433), the proposed changes are consistent or more restrictive than the current licensing basis, and therefore are acceptable.

18. It is unclear why the actual permissible values for the tests to be performed on fuel oil are deleted in SR 4.9.A.

Response - The details of the methods for performing the EDG fuel oil Surveillances are not necessary for inclusion in the Technical Specifications. These details are adequately controlled by procedures and their revisions are adequately controlled by the provisions of 10 CFR 50.59. Proposed TSUP SR 4.9.A for fuel oil tests is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A requirements for fuel oil and the current licensing basis is enhanced by the additional Technical Specification surveillance requirements, the proposed changes are therefore acceptable.

19. Proposed SR 4.9.A.6.b allows five times the STS-allowed value for particulate content, without justification. This is a relaxation of requirements and should be discussed.

Response - There are no current specific Technical Specification requirements for particulate content at both Dresden and Quad Cities Stations. Therefore, the proposed TSUP is not a relaxation of current Technical Specification requirements. TSUP SR 4.9.A.6.b requires a particulate contamination limit of 10 mg/liter. One liter is equivalent to 1000

ComEd TSUP RAI Response

ml. STS 4.8.1.1.2.d.2 requires impurities to be less than 2 mg per 100 ml. Two (2) mg per 100 ml is equivalent to 20 mg per liter. Therefore, proposed TSUP SR 4.9.A.6.b is two times (100%) more restrictive to STS requirements. In addition, as previously stated, the current licensing basis does not provide any acceptance criteria for diesel fuel. Therefore, because the proposed TSUP SR 4.9.A.6.b is more conservative than STS, is more conservative and enhances the current licensing basis, it is therefore acceptable.

20. Why are the 2000 hour ratings listed in 4.9.A.8.h higher than the 2 hour ratings?

# Response - The proposed requirements are not the 2 hour ratings. The 2 hour rating is > 2860 kw. The proposed SR is run for at 110% of rated for 2 hours.

21. Proposed SR 4.9.A.10 does not include pressure testing the system, as required in the related STS SR. Attachment 2, paragraph A.26 makes it appear that it was to be included, or else a justification for not including it is needed.

Response - As stated in Note A.26 of Attachment 2, the diesel generator support systems are not designed to ASME requirements. STS SR 4.8.1.1.2.g.2 refers to those portions of the oil system designed to ASME requirements. Because the associated system does not meet those criteria, STS SR 4.8.1.1.2.g.2 is not applicable to the Dresden and Quad Cities EDG system design. In addition, TSUP SR 4.9.A.10 is a new surveillance requirement not part of the current licensing basis. Proposed TSUP SR 4.9.A.10 is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.A.10 requirements and the current licensing basis is enhanced by the additional Technical Specification surveillance requirements, the proposed changes are therefore acceptable.

22. Proposed SR 4.9.B requires following SR 4.9.A except 4.9.A.2.d. This exception is apparently in error, and does not match the exception in the related STS.

Response - TSUP 4.9.A.2.d is equivalent to STS 4.8.1.1.2.a.5. Proposed TSUP SR 4.9.B is equivalent to STS SR 4.8.1.2. TSUP SR 4.9.B requires A.C. Source operability to be determined by the performance of all surveillances encompassed within TSUP SR 4.9.A (i.e., 4.9.A.1, 4.9.A.2, 4.9.A.3, 4.9.A.4, 4.9.A.5, 4.9.A.6, 4.9.A.7, 4.9.A.8, 4.9.A.9 and 4.9.A.10) with the single exception of SR 4.9.A.2.d (EDG panelled to offsite power). This exception (the only required EDG and the only required offsite circuit connected) presents a risk of a single fault resulting in a station blackout. The exception does not take exception to the requirement for the EDG to be capable of performing the particular function; just to the requirement to demonstrate it while that source of power is being relied upon to support meeting the LCO. The proposed requirements are consistent to the current licensing basis and are acceptable for inclusion in the TSUP program.

23. Proposed Action statements 1 and 2 under LCO 3.9.C lengthen the amount of time that batteries may remain out of service, making them equivalent in some cases to current Quad Cities requirements, without justification as to why Dresden is sufficiently like Quad Cities. Citing the use of 72 hours as a compromise between AOTs of 2 hours to 14 days is inaccurate, as the AOTs allowing more than 2 or 72 hours are specific and relate to a total time in an operating cycle. Action statement 2 is confusing in its wording, but allows longer to restore a 125V battery to service if the opposite unit is also operating than if it were shutdown. This does not make sense, is contrary to current requirements, and is not justified.

Response - ComEd will revise the requirements to be consistent or more conservative than existing licensing basis requirements. However, this should be left as an open item, contingent upon its implementation and correction in the TSUP clean-up package.

24. Proposed SR 4.9.C.4 does not incorporate all STS 18 month battery requirements. The associated note (C.6) in attachment 2 states that all STS requirements are incorporated. This should be discussed.

Response - ComEd agrees the wording in Note C.6 of Attachment 2 is unclear and apologizes for any confusion this may have caused the NRC staff. The specific surveillance requirements listed in STS 4.8.2.1.d.2 were not included in proposed TSUP SR 4.9.C as this information is more appropriate for owner-controlled documentation. In addition, proposed TSUP SR 4.9.C.4 is consistent to the current battery system and Technical Specification requirements at Dresden and Quad Cities Stations. The current Technical Specification surveillance requires "...the unit's batteries shall be tested to verify that the battery capacity is adequate to supply and maintain operable the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test." Proposed TSUP SR 4.9.C.4 is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.C.4 requirements and the current licensing basis is maintained, the proposed changes are therefore acceptable.

25. Proposed SR 4.9.C.4 allows a different battery capacity during the 60 month test discharge, but does not specify if the higher or the lower of the two is acceptable.

Response - TSUP SR 4.9.C.4 is for the battery service test. A battery service test is a special test of the battery's capability to satisfy the design requirements (duty cycle) of the DC electrical power system. The 60-month test is performed as SR 4.9.C.5. SR 4.9.C.5 is the battery performance test. A battery performance test is a test of constant current capacity of a battery to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and

usage. Proposed TSUP SR 4.9.C.4 is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP SR 4.9.C.4 requirements and the current licensing basis is enhanced by the addition of specific Technical Specification acceptance criteria, the proposed changes are therefore acceptable.

26. Proposed Table 4.9.C-1 improperly places note "b" in the box associated with Specific Gravity and Limits For Each Connected Cell. This should be discussed.

Response - Proposed TSUP Table 4.9.C-1 is consistent to the battery system requirements at Dresden and Quad Cities Stations. The current Technical Specification surveillance requires "...the specific gravity, voltage and temperature of the pilot cell and overall battery voltage shall be measured." There are no specific acceptance criteria of any kind mentioned in the current Technical Specifications. Proposed TSUP Table 4.9.C-1 is consistent to requirements specified in the Improved Standard Technical Specifications (ITS - NUREG - 1433). Because there is no reduction in existing plant safety margins by the proposed TSUP Table 4.9.C-1 requirements and the current licensing basis is enhanced by the addition of specific Technical Specification acceptance criteria, the proposed changes are therefore acceptable.

27. Proposed note "a" under SR 4.9.C and 4.9.D allows the use of an alternate 125V battery. However, the associated LCOs do not discuss this. This should be clarified.

Response - The alternate battery is a backup battery system utilized to enhance system availability - the 125 VDC system is not designed as a fully redundant, independent, redundant train type of system. As such, the alternate batteries are not required to meet the 125 VDC system design basis and may never be utilized. In order to utilize the backup system as a contingency to replace the normal battery system for a short period of time, the alternate battery must meet all operability requirements as demonstrated by the associated Surveillance Requirements. At the conclusion of the Action statement, it is necessary to return the normal 125 VDC system to service. The exclusion of the alternate batteries from the Limiting Condition for Operation is consistent to the current licensing basis and does not reduce existing plant safety margins and is therefore acceptable.

28. The proposed applicability for 3.9.G lists an exception to mode 4 that it only applies when a control rod is withdrawn. However, the discussion in attachment 2, paragraph F.1 states that the exception applies when there is no fuel in the reactor vessel and when no control rods are withdrawn. These directly conflict. Also, justification needs to be provided why Dresden and Quad Cities should be allowed to use an exception allowed at Perry.

Response - Where there is no fuel in the reactor vessel, the reactor is considered not to be in any OPERATIONAL MODE, as defined in Table

Notation (f) to TSUP Table 1-2. Therefore, TSUP LCO 3.9.G does not apply. When there is no fuel in the vessel, it is not necessary or required to have an operable RPS Power Monitoring system. This is consistent to the current licensing basis which does not reduce existing plant safety margins and is therefore, acceptable.

Footnote (a) in TSUP states "With any control rod withdrawn." not "When no control rods are withdrawn." The difference is outlined as follows - TSUP LCO 3.9.G requires the operability of two (2) RPS electric power monitoring channels for each RPS MG set or alternate power supplies during Cold Shutdown conditions (Mode 4 as defined in TSUP Table 1-2) with any control rod withdrawn. During Mode 4, the RPS Power Monitoring system is required to be operable if control rods are withdrawn. If rods are not withdrawn during Mode 4 conditions, then the requirements of the RPS Power Monitoring system are not required to support the safe operation of the plant. This is also consistent to the current licensing basis of the plant.

The proposed TSUP Applicability requirements are more restrictive than the current licensing basis at Quad Cities because the RPS Power Monitoring system is not required to be operable during <u>all</u> shutdown conditions. There are no qualifiers further specifying when those requirements should be enhanced. TSUP allows the RPS Power Monitoring system to be inoperable during Cold Shutdown conditions but requires all control rods to be inserted. Therefore, because the existing safety margins are increased and the current licensing basis (especially for Quad Cities) is enhanced, the proposed changes are acceptable.

29. Proposed SR 4.9.G.1 changes current and STS SRs from a 6 month periodicity to a period that could last an entire cycle. The justification cites GL 91-01 as recommending this change as an alternative to current requirements. The proposed periodicity represents a relaxation of requirements and requires further justification.

Response - The proposed requirements are consistent to the current licensing basis at both Dresden and Quad Cities. At the time of the submittal of TSUP 3/4.9 (P. Piet letter to T. Murley, dated March 26, 1993), this was not the case for Quad Cities. Generic Letter 91-09 was used as the basis for Amendment Nos. 142/137 approved by the NRC staff for Quad Cities on May 28, 1993. Because the proposed requirements are consistent to GL 91-09 and to the current licensing basis, there is no relaxation of existing safety margins and therefore, the proposed TSUP 4.9.G.1 is acceptable.

30. Proposed Action statements do not include provisions for inoperable 24/48V batteries or chargers. Is this an oversight?

Response - No. The aforementioned requirements are included in Dresden TSUP Section 3/4.9.C, D.C. Sources - Operating. The 24/48V battery charger action requirements are included in Dresden TSUP 3.9.C, Action 1. As stated

in Attachment 2, Section C.1 of ComEd's March 26, 1993 submittal, the 24/48 volt batteries are only included in the Dresden Technical Specifications due to design differences in the supported equipment. At Quad Cities, no equipment is supported by these batteries which is required for safe shutdown of the units. As described in the UFSAR, SRM and IRM instrumentation are the two systems supported by the Quad Cities 24/48 VDC system. At Dresden, as described in the UFSAR, the 24/48 VDC system supports the analog trip systems, the dP-type scram discharge volume level switches, the signal isolators and the stack gas, radwaste discharge and offgas radiation monitors. Therefore, there is no reduction in the existing plant safety margin at Quad Cities Station by the relocation of controls of the 24/48 battery system to station administrative methods.

31. Proposed SR 4.9 deletes the current monthly requirement for an operability check on the diesel starting air compressors without justification.

Response -Air compressor requirements are included in TSUP SR 4.9.A.2.f. TSUP SR 4.9.A.2.f is more restrictive than the current Technical Specifications as it provides an acceptance limit to which the EDG starting air receiver tanks must achieve. The current Technical Specification requirements do not specify operability criteria. Because the proposed requirements are more restrictive than the current licensing basis and provide enhanced guidance to site operating personnel, the proposed changes increase existing plant safety margins and are therefore acceptable.

32. The third paragraph of proposed bases page 3/4.9-3 requires editing.

Response - ComEd appreciates the NRC staff's comments on the Tech Spec Bases. ComEd will evaluate the NRC staff's comments regarding the Bases for applicability. ComEd will evaluate changes to the TSUP Bases under the auspices of 10 CFR 50.59 and will notify the NRC staff accordingly, if any such changes are forthcoming. ComEd will modify the TSUP Bases for any such changes accordingly. These should be left as open items, contingent upon its implementation and correction, if applicable, in the TSUP clean-up package.

33. Attachment 6 (Sections 3/4.9, 3/4.10, and 5.0) states that:

"It has been determined that the proposed changes meet the criteria for a categorical exclusion as provided under 10 CFR 51.22(c)(9). This conclusion has been determined because the changes requested do not pose significant hazards consideration or do not involve a significant increase in the amounts, and no significant changes in the types, of any effluent that may be released offsite."

However, the 10 CFR 51.22(c)(9) exclusion is for changes which involve installation or use of a component, or which changes an inspection or surveillance requirement which also meet the criteria listed above. The incomplete application of the referenced

exclusion is incorrect, and it appears that an environmental assessment statement is required, as most of the proposed changes to this section do not involve components, or inspection or surveillance requirements.

Response - 10 CFR 51.22(c)(9) states "Issuance of an amendment to a permit or license for a reactor pursuant to part 50 of this chapter which changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in part 20 of this chapter, or which changes an inspection or a surveillance requirement, provided that ....". TSUP Sections 3/4.9, 3/4.10 and 5.0 clearly fall under the auspices of the use of a facility or component located with the restricted area and as such, we believe 51.22(c)(9) applies.

### <u>Marked-Up Current Dresden Unit 2 and Quad Cities Unit 2</u> <u>Technical Specifications</u>

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F3 up 3/4.9 CLOSS - REFERCE DRESDEN II

DPR-19

Maximum fuel design

limiting ratio for

centerline melt

(FDLRC).

Amendment No. 111

4.1 SURVEILLANCE REQUIREMENTS

a.

OR INFORMATION ONLY

(Cont'd.)

- 3.1 LIMITING CONDITIONS FOR OPERATION (Cont'd.)
  - The APRM scram and a. rod block settings shall be reduced to the values given by the equations in Specifications 2.1.A.1 and 2.1.B. This may be accomplished by increasing APRM gains as described therein.
  - b. The power distribution shall be changed such that the fuel design limiting ratio for centerline melt (FDLRC) for any fuel assembly no longer exceeds 1.0.

Two RPS electric power monitoring channels for each inservice RPS MG set or alternate source shall be OPERABLE at all times

3.

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But 4.9.G.1

Ful 4.4.6 Deleted b. 3. The RPS power monitoring system

instrumentation shall be determined OPERABLE:

By performance of a. a CHANNEL FUNCTIONAL TEST each time the unit is in COLD SHUT-DOWN for a period of more than 24 hours, unless performed in the previous 6 months.

3/4.1-2



FOR INFORMATION ONLY Amendment No. 80, 82 4.1 SURVEILLANCE REQUIREMENTS 3.1 LIMITING CONDITIONS FOR OPERATION (Cont'd.) (Cont'd.) 73 W 4,9,9, status within 72 hours or remove the associated RPS MG set or alternate power supply from service. With both RPS electric 5. power monitoring channels for an 75 up 4.9.6, Action 2 inservice RPS MG set or alternate power supply inoperable, restore at least one to OPERABLE status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

DRESDEN II

DPR-19



)	FOR INFORMATION ONLY	DRESDEN II DPR-19
3.9	LIMITING CONDITION FOR OPERATION 4.9 (Cont'd.)	SURVEILLANCE REQUIREMENT (Cont'd.)
·	Full 4.9. C. 4	the design duty cycle when the battery is subjected to a battery service test. Specific gravity and voltage of each cell shall be determined after each service test.
	4. 5 w 4.9. C.5	At least once per 60 months, in lieu of the battery service test required by 4.9.A.3, the Unit's batteries shall be subjected to a performance discharge test to verify that the battery capacity is the greater of either 80% of the manufacturer's rating or the minimum acceptable battery capacity from the latest revision of the load profile when subjected to a performance discharge test.
	5. 5. (5 m 4.9.0.6) (8 mos)	For any battery that shows signs of degradation or has reached 85% of the service life for the expected application as determined under Section 4.9.A.4, a perform- ance discharge test of battery capacity shall be performed at least once each operating cycle. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.
	5. TSUD \$,9,C footnute (2)	To assure operability prior to use, once the alternate 125 volt battery cell-to-cell connections are completed and the maintenance charger placed into service, each such battery shall adhere to the surveillances specified in 4.9.A.

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# FOR INFORMATION ONLY

DRESDEN II DPR-19 Amendment No. 119



FOR INFORMATION ONLY DRESDEN II DPR-19 Amendment No. 119 LIMITING CONDITION FOR OPERATION 3.9 4.9 SURVEILLANCE REQUIREMENT (Cont'd.) (Cont'd.) permissible only during the succeeding seven days unless the second line is sooner TSUP 3.9, A,. placed in service providing both the Unit 2 and Unit Action 1 2/3 emergency diesel genera. tors are demonstrated operable per Specification 4.9.D.1.a. From and after the date that incoming power is not available from any 15inp 3.9, A, Actin 5 line, reactor operation is permissible providing both the Unit 2 and Unit 2/3 emergency diesel generators are demonstrated operable per Specification 4.9.D.1.a and all core and containment TS up 3.9.A, cooling systems are operable Action 4.2 and the NRC is notified within 24 hours of the situation, the precautions to be taken during this Deleted situation, and the plans for prompt restoration of incoming power. 2. From and after the а. date that one of the diesel generators T3 (1) 3, 9, A, Adim 2. C and/or its associated bus is inoperable, reactor operation is permissible according to Specification 3.9.B.2.c and 3.9.D only during the succeeding seven days unless the diesel generator and/or bus TS UP 3.9.A, Adin 2.2 is sooner made operable, provided that during such seven days two offsite lines as specified in 3.9.A are available) / If the TS up 3, 9, A, Action 2.6 GPERABLE diesel became inoperable for any cause

3/4.9 - 3

FOR INFORMATION ONLY DRESDEN II DPR-19 Amendment No. 119 3.9 LIMITING CONDITION FOR OPERATION 4.9 SURVEILLANCE REQUIREMENT (Cont'd.) (Cont'd.) other than pre-planned preventative maintenance or testing, the TS ul 3.9, A, Adim 2.5 operable diesel generator shall be demonstrated operable per Specification 4.9.D.1.a immediately and daily thereafter. w. Hun Subsequen 72 have

3/4.9-3a

FOR INFORMATION ONLY DRESDEN II DPR-19 Amendment No. 119 3.9 LIMITING CONDITION FOR OPERATION 4.9 SURVEILLANCE REQUIREMENT (Cont'd.) (Cont'd.) b. Deleted. During any period when the unit or shared diesel generator is inoperable, continued reactor operation is permissible only during the succeeding seven days provided that all of the low pres-TSup 3.9, A, Action 4.2 sure core cooling and containment cooling subsystems shall be operable. If this requirement TS ul 3.9, A, Action 4,6 cannot be met, an



3/4.9-5



FOR INFORMATION ONLY

DRESDEN II Amendment No. 119

DPR-19



3/4.9-6

#### FOR INFORMATION ONLY DRESDEN II DPR-19 Amendment No. 82,87,98,107 3.9 LIMITING CONDITION FOR OPERATION 4.9 SURVEILLANCE REQUIREMENT (Cont'd.) (Cont'd.) (b) Verifying the diesel starts from ambient condition on the auto-start -3MP 4.9.4.8.5(2) signal, energizes the emergency buses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer, and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads.

#### Quad-Cities DPR-30

#### 3.9/4.9 AUXILIARY ELECTRICAL SYSTEMS

FOR INFORMATION ONLY





Amendment No. 134

Bul 4,9,C.1 Toble 4,9,C-1 FOR INFORMATION ONLY Parted, DPR-30 B. Station Batteries **B.** Station Batteries The unit 24/48-volt batteries, two TSup 4.9.C.2 TSup 4.9.C.2 Table 4.9.C.1 1. Every week the specific gravity and station 125-volt batteries, the two voltage of the pilot cell, the station 250-volt batteries, and a temperature of adjacent cell, and battery charger for each required overall battery voltage shall be battery shall be operable before the measured. reactor can be made critical. -Mirles! 2,3 2. Every 3 months the measurement shall be made of the voltage of each cell to the nearest 0.01 volt, the specific gravity of each cell, and the 18 NOS temperature of every fifth cell. FS UP 3.9.C At least once each operating cycle, the unit's batteries shall be tested to verify that the battery capacity is adequate to supply and maintain operable the actual or simulated Lg,C2 Surch a. emergency loads for the design duty cycle when the battery is T3 up 4,9, C.4 subjected to a battery service test. Specific gravity and voltage of each cell shall be determined after each service test. At least once per 60 months, in lieu of the battery service test required by 4.9.B.3, the Unit's batteries shall be subjected to a performance discharge test to verify that the battery capacity is the greater of TS up 4.9.c.5 either 80% of the manufacturer's rating or the minimum acceptable battery capacity from the latest revision of the load profile when subjected to a performance discharge test. 5. For any battery that shows signs of TS W 4.9.C.6 degradation or has reached 85% of the service life for the expected application as determined under Section 4.9.B.4, a performance discharge test of battery capacity shall be performed at least once each operating cycle. Degradation is indicated when the battery 8 ms capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating. 3.9/4.9-3 Amendment No. 134

T3 up 4,9,C, footnate (2) FOR INFORMATION ONL Quad-Cities (BWP 3.9. A.1 6. To assure operability prior to use, once the alternate 125 volt battery cell-to-cell connections are completed and the maintenance charger placed into service, each such battery shall adhere to the surveillances specified in 4.9.B. C. Electric Power Availability C. Electric Power Availability Whenever the reactor is in the Run The availability status of electric mode or for startup from a hot power shall be checked daily. shutdown condition, the availability of dow electric power shall be as specified in SPERABLE Specifications 3.9.A and 3.9.B except as stated in Specifications 3.9.C.1, 3.9.C.2, 3.9.C.3, and 3.9.E. TSIN 4,9.A.1 From and after the date that incoming power is available from only one of the lines specified in 3.9.A, continued reactor operation is permissible only during the succeeding 7 days, unless the second line is sooner made TSWP 3.9.A, available, providing both the Unit Action 1 OPERABLE and Unit 1/2 emergency diesel generators are demonstrated operable per Specification 4.9.A.1.a(1).~ TSUP 3.9.A Actin 51 2. From and after the date the incoming power is not available from any line, continued reactor operation is permissible providing both the Unit and Unit 1/2 emergency diesel generators are FS WP 3,9, A, demonstrated operable per Specification 4.9.A.1.a(1)/all core and containment cooling systems. are operable, reactor power level is PELETED reduced to 40% of rated, and the NRC is notified within 24 hours of the situation, the precautions to be PELETER taken during this period, and the plans for prompt restoration of incoming power.

Amendment No. 134

FOR INFORMATION ONLY Quad-Cities **DPR-30** 3. From and after the date that one of the TSup 3.9. C Action 1 two 125/250-volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible only during the succeeding 3 days unless such battery system is sooner made operable. With both units operating, each 125 я. volt battery may be inoperable for TSUP foatnote up to a maximum of seven days per operating cycle for maintenance or testing, provided the alternate 125 volt battery is placed into service and is operable per specification 4.9.B.6. b. With the other unit in cold shutdown or refueling, operations TS UP 3,9, D may continue with one of the two 125 volt battery systems inoperable provided the alternate 125 volt battery is placed into service and is operable per specification 4.9.B.6. c. If it is determined that a 125 volt battery need be replaced as a result But footnate of maintenance or testing, a specific battery may be inoperable for an additional seven days provided the (75 ul 4.9, A.2.2) Toble 4.9, A-1 Toble 4.9, A-1 alternate 125 volt battery is placed into service and is operable per specification 4.9.B.6. D. Diesel Fuel D. **Diesel Fuel** There shall be a minimum of 10,000 Once a month the quantity of diesel gallons of diesel fuel supply on site for fuel available shall be logged. each diesel generator. Once a month a sample of diesel fuel shall be checked for quality. TSUP 3.9. A. 2.6 ts up 4.9, A.S, ISUD 4.9. A.6

3.9/4.9-5

Amendment No. 134

Quad-Cities FOR INFORMATION ONLY **DPR-30** E. Diesel-Generator Operability E. Diesel-Generator Operability Whenever the reactor is in the 1. Deleted. Startup/Hot Standby or Run mode and the unit or shared diesel generators and/or their respective TSUP 3,9, A, Action 2.c. associated buses are inoperable, continued reactor operation is permissible only during the succeeding 7 days provided that all Bup 3.9, A. Artim 4,2 of the low-pressure core cooling and all loops of the containment cooling mode of the RHR system associated with the operable diesel, generator shall be operable and two offsite lines as specified in 3.9.A are evailable. If the diesel

within 8 h

within subseque

72 ha

OPERABLE

1.

generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the operability

of the remaining operable diesel

4.9.A.1.a(1) immediately and daily thereafter. If these requirements

shutdown shall be initiated and the

generator by performing

surveillance requirement

cannot be met, an orderly

reactor shall be in the cold shutdown condition within 24

hours.

2. Deleted.

2. During each refueling outage, a simulated loss of off-site power in conjunction with an ECCS initiation signal test shall be performed on the 4160 volt emergency bus by:

T3 UP 3,9,A

Action 4.6

TSUP 4.9. A.8.

Verifying de-energization of а. the emergency buses, and load shedding from the TS 4P 4,9, A.8, f(1) emergency buses.





# Marked-Up Draft Revision 4 of the BWR/4 Standard Technical Specifications

ELECTRICAL POWER SYSTEMS 3/4.(8) FOR INFORMATION ONLY 3/4.18.1 A.C. SOURCES A.C. SOURCES - OPERATING LIMITING CONDITION FOR OPERATION 3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE: Two physically independent circuits between the offsite transmission /a. network and the onsite Class 1E distribution system, and Separate and independent diesel generators 0, 1A, 2A and 2B with: For diesel generator 0, 1A and 2A: each A separate day fuel tank containing a minimum of a) \$250 gallons of fuel. available 205 A separate fuel storage system containing a minimum of b) 31,000 gallons of fuel. available 10,000 For diesel generator 2B, a separate fuel storage tank and a day 2. tank containing a minimum of 29,750 gallons of fuel. A separate fuel transfer pump. bil OPERATIONAL CONDITIONS 1, 2, and 3. **APPLICABILITY:** MODE(S) ACTION: Afsite circuit With one offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining 4. 4. 4.1. 2 A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a officte within 1 hour and at least once per 8 hours thereafter. If any of cicuit the diesel generators have not been successfully tested within the past 24 hours, demonstrate their OPERABILITY by performing Surveillance Requirement 4.8.1.1.2.a.4) for each such diesel (inoperable generator, separately, within 24 hours. Restore the offsite circuit to OPERABLE status within 72 hourse or be in at least HOT SHUTDOWN 9,A.2. within the next 12 hours and in COLD SHUTDOWN within the following cerent preve 24 hours. one of the shove required) (7 days ower sources 0 in With either the O or 2A diesel generator inoperable, demonstrate the OPERABILITY of the above required A.C. offsite sources 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 the OPERABILITY of the remaining OPERABLE 4.9.A.1.2 \*See page 3/4 8-1(a) LASALLE - UNIT 2 Amendment No. 56 3/4 8-1 Les used FOR SIMPLICTIN
ELECTRICAL POWER SYSTEMS

#### LIMITING CONDITION FOR OPERATION (Continued)

\*For the purposes of completing maintenance, modification, and/or technical specification surveillance requirements, on the O diesel generator and its support systems during a refuel outage, as part of pre-planned maintenance, modifications, and/or the surveillance program, the requirements of action statement b are modified to:

- 1. Eliminate the requirement for performing technical specification surveillance requirements 4.8.1.1.1.a on each operable AC source, immediately and once per 8 hours thereafter, when the 0 diesel generator is declared inoperable.
- 2. Allow an additional 96 hours in excess of the 72 hours allowed in action statement b for the 0 diesel generator to be inoperable.

Provided that the following conditions are met:

- A. Unit 1 is in operational condition 4 or 5 or defueled prior to taking the 0 diesel generator out of service.
- B. Surveillance requirements 4.8.1.1.1a and 4.8.1.1.2a.4 are successfully completed, for the offsite power sources and the 1A and 2A diesel generators, within 48 hours prior to removal of the 0 diesel generator from service.
- C. No maintenance is performed on the offsite circuits or the 1A or 2A diesel generators, while the 0 diesel generator is inoperable.
- D. Technical specification requirement 4.8.1.1.1a is performed daily, while the 0 diesel generator is inoperable.

E. The control circuit for the unit cross-tie circuit breakers between buses 142Y and 242Y are temporarily modified to allow the breakers to be closed with a diesel generator feeding the bus, while the O diesel generator is inoperable.

The provisions of technical specification 3.0.4 are not applicable.

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### FOR INFORMATION ONLY

LIMITING CONDITION FOR OPERATION (Continued) 16) 4.9.A.2.C ACTION: (Continued) diesel(generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24\_hours, herel poure for the above With one offsite circuit of the above-required A.D. sources and diesel generator 0 or 2A of the above required A.C. electricl power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a. 49 A. ( . a within I hour and at least once per 8 hours thereafter. If the (fite power diesel generator became inoperable due to any cause other than Source preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generatons, separately, (e) by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours. Restore at least one of the inoperable A.C. sources to 4,9,A.2. C (G) OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and diese! both Hu ( + In 25 " generators 0 and ZA to OPERABLE status within 2 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 days even ofer AALE disse hours and in COLD SHUTDOWN within the following 24 hours. nuator (ore With diesel generator 2B of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the offsite A.C. sources 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 the OPERABILITY of he remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*. Restore diesel generator 2B to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by specification 3.5.1. Power (e) Sources) both of the ab ve rogens y Awo) With both of the above required offsite circuits inoperable. demonstrate the OPERABILITY of the remaining A.C. sources; 4.9.4.2.0 separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless the diesel generators are already operating. Restore at least one offsite circuit to OPERABLE status within 24 hours, or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore This test is required to be completed regardless of when the inoperable diesel The provisions of Specification 3.0.2 generator is restored to OPERABILITY. £B are not applicable. In failures that are potentially generic to the romaining diciel generation and for which. synophists alternative Costing connect be designed-8-2 Amendment No. 96 3/4 8-2 LASALLE - UNIT 2

ELECTRICAL POWER SYSTEMS

LIMITING CONDITIONS FOR OPERATION (Continued)

7 days Footnate (e) ACTION (Continued) at least two offsite circuits to OPERABLE status within 2 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. A successful test(s) of diesel generator 4,9, A, Z, C OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.4 performed under this ACTION statement for the OPERABLE diesel generators, satisfies the diesel generator test requirements of See TSU ACTION (statement and 1012 shove) (both of the above required) Actionle With diesel generators 0 and 2A of the above required A.C. 6.4 electrical power sources inoperable, demonstrate the OPERABILITY of the cemaining A.C. sources by performing Surveillance Requirement offsite 4 A.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. and Surveillance Requirement 4.8.1.1.2.a.4 for the 2B and 1A diesel arren J.9. A.1.2 generators, separately, within 8 hours ... Restore at least one of Pearttin the inoperable diesel generators O or 2A to OPERABLE status within 2 eguire at hours, or be in`at least HOT SHUTDOWN within the next 12 hours and Stove in COLD SHUTDOWN within the following 24 hours. (Restore toth diese) reg generators () and 2A) to OPERABLE status within V2 hours, from the time of initial loss, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. With diesel generator 1A of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If the 1A diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the 2A diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4, within 24 hours\*. Restore the inoperable diesel generator 1A to OPERABLE status within 72 hours or declare standby gas treatment system subsystem A, Unit 1 drywell and suppression chamber hydrogen recombiner system, and control room and auxiliary electric equipment room emergency filtration system train A inoperable, and take the ACTION required by specifications 3.6.5.3, 3.6.6.1, and 3.7.2. Continued performance of Surveillance Requirement 4.8.1.1.1.a is not required provided the above systems are declared inoperable and the action of their respective specifications is taken. \*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY. The provisions of Specification 3.0.2 are not applicable. Su previous Note (6)

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Amendment No. 56

### FOR INFORMATION ONLY

#### LIMITING CONDITIONS FOR OPERATION (Continued)

ACTION (Continued)

1.

- h. With one offsite circuit of the above required A.C. electrical power sources and diesel generator 2B inoperable, apply the requirements of ACTION a and d specified above.
- i. With either diesel generators 0 or 2A inoperable and diesel generator 2B inoperable, apply the requirements of ACTION b and d specified above.
- j. With one offsite circuit of the above required A.C. electrical power sources and diesel generator 1A inoperable, apply the requirements of ACTION a and g specified above.
- k. With diesel generator 2B and diesel generator 1A inoperable, apply the requirements of ACTION d and g specified above.
  - With diesel generator 0 and diesel generator 1A inoperable, apply the requirements of ACTION b and g specified above.

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### FOR INFORMATION ONLY

SURVEILLANCE REQUIREMENTS

4.8.1.1.1) Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be: Determined OPERABLE at least once per 7 days by verifying correct a. breaker alignments and indicated power availability, and b. Demonstrated OPERABLE at least once per 18 months during shutdown by manually transferring unit power supply from the normal circuit to the alternate circuit. 4.8.1.1.2 > Each of the above required diesel generators shall be demonstrated OPERABLE: < 1.9, A-1) (2) In accordance with the frequency specified in Table 4.8.1.1.2-1 (on a (a ) STAGGERED TEST BASIS by: (il day) and the bulk Verifying the fuel leve  $in_{\lambda}$  the day fuel tank. 2 Verifying the fuel level in the fuel storage tank. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank. Gil day) Verifying the diesel starts from ambient condition and accelerates to 900 rpm + 5%, -2% in less than or equal to 13 seconds. \*\* The quite generator, voltage and frequency, shall be 4160 ± (150 volts and Synchroneus 60 ( 3.0, 71.2 Hz Within 13 seconds\*\* after the start signal) speed Verifying the diese generator is synchronized, and then loaded to between 2400 kW to 2600 kW\*\*\* within 60 seconds, \*\* and operates with this load for at least 60 minutes. e MAll planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period. as recommended by the manufacturer. e \*\*Surveillance testing to verify the diesel generator start (13 second) and (3) load (60 second) times from ambient conditions shall be performed at least) once per 184 days. All other engine starts performed for the purpose of / meeting these surveillance requirements may be conducted in accordance with warmup and loading procedures, as recommended by the manufacturer, in order to minimize mechanical stress and wear on the diesel generator caused by fast starting and loading of the diesel generator. J.D. \*\*\* Transients, outside of this load band, do not invalidate the surveillance tests/. (d) this band is meant as guidance to avoid routine overloading of the engine Lords in excess of this band for special testing under direct monitoring by the manufactures or momentary variations due to changing bus lords shall not invalidated the test. (d) diesel-genusta tests shell be conducted in accordance with the manufacture resorded engine palete, lease detection and warmup puccedences, and as ciplicall my and Shutelay 3/4 8-3 Amendment No. 56 R/A Amendment No. 56/ ZUNIT LASAI recommendations Surviellance Requirements 4.9. A. 7. 2 and 6 may be substituted to Survellouse Regenements 4.9. A. 2, c and d.

### FOR INFORMATION ONLY

#### SURVEILLANCE REQUIREMENTS

Verifying the diesel generator is aligned to provide standby power to the associated emergency busses. Verifying the pressure in required diesel generator air starting and receivers to be greater than or equal to 200 psig. (220) At least once per 31 days and after each operation of the diesel 3 where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day fuel tanks. By sampling and analyzing stored and new fuel oil in accordance with C. the\_following:-At least once per 92 days, and for new fuel oil prior to 1, addition to the storage tanks, that a sample obtained and 4. tested in accordance with the applicable ASTM Standards has: a) A water and sediment content within applicable ASTM limits. b) A kinematic viscosity at 40°C within applicable ASTM limits. At least every 31 days, and for new fuel oil prior to addition 6. to the storage tanks, that a sample obtained in accordance with the applicable ASTM Standard has a total particulate contamination of less than 10 mg/l when tested in accordance with the applicable\_ASTM Standard. Each of the required diele generators shall be demonstrated OFERADLE (2) "At least once per 18 months during shutdown by: 8. (a) Subjecting/the diesel to an inspection in accordance with Its is racht si procedures prepared in conjunction with its manufacturer's instructions recommendations for this class of standby service. Verifying the diesel generator capability to reject a load of greater than or equal to 1190 kW for diesel generator 0, greater than or equal to 638 kW for diesel generators 1A and 2A, and greater than or equal to 2421 kW for diesel generator 2B while maintaining engine speed less than or equal to 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal. whichever is less. full-emergency Verifying the diesel generator capability® to reject a load of 2600 kW without tripping. The generator voltage shall not exceed 5000 volts during and following the load rejection. Simulating a loss of offsite power by itself, and:

<sup>&</sup>lt;sup>\*</sup>All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.



ELECTRICAL POWER SYSTEMS



\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

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#### SURVEILLANCE REQUIREMENTS (Continued)

2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 13 seconds, energizes the auto-connected emergency loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the <u>emergency loads</u>. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ±416 volts and 60 ±1.2 Hz during this test. b) For Division 3: Verifying de-energization of the emergency bus. 1) 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with its loads within 13 seconds and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency bus shall be maintained at 4160 ±416 volts and 60 ±1.2 Hz during this test. omati e Verifying that all diesel generator Q, 2A, and 2B automatic trips except the following are automatically bypassed on an ECCS actuation signal: emigen For Divisions 1 and 2 engine overspeed generator a) differential current, and emergency manual stop. For Division 3 - engine overspeed, generator differential b) current, and emergency manual stop. between 2730 2260 Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to (2860 kWA and during) Łd) the remaining 22 hours of this test, the diesel generator shall be loaded to 2400 kW to 2600 kW. The generator voltage and frequency shall be 4160 420, -150 volts and 60 43.0, -1.2 Hz 7 within 13 seconds after the start signal; the steady-state (+420) Ŧ1.2 \*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer. Fransients, outside of this load band, do not invalidate the survillance

See previous mark -

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tests.

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#### SURVEILLANCE REQUIREMENTS (Continued)

4,9A.8. F. 29) generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24 hour test, perform Surveillance Requirement (4.8.1.1.2.d.4.a).2) and b). 2). \*\* e Verifyind that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 2860 kW. Verifying the diesel generator's capabilitv to: Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power, Transfer its loads to the offsite power source, and Be restored to its standby status. Verifying that with diesel generator 0, 2A, and 2B operating\* in a 11. test mode and connected to its bus: a) For Divisions 1 and 2, that a simulated ECCS actuation signal overrides the test mode by returning the diesel generator to standby operation. For Division 3, that a simulated trip of the diesel b) generator overcurrent relay trips the SAT feed breaker to bus 243 and that the diesel generator continues to supply normal bus loads. Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within  $\pm$  10% of its design interval (for diesel generators 0 and 2A. 13. Verifying that the following diesel generator lockout features prevent diesel generator operation only when required: See previous Note (2)  $\stackrel{*}{\rightarrow}$ All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period. as recommended by the manufacturer. (4.9, A.8-F.2 12) \*\*If Surveillance Requirements 4.8.1.1.2.d.4.a)2) and/or b)2) are not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test. Instead, the diesel generator may be operated at 2600 kW for 1 hour or until operating temperature has stabilized. exmented Amendment No. 56 LASALLE - UNIT 2 3/4 8-7

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#### SURVEILLANCE REQUIREMENTS (Continued)

Generator underfrequency. a) b) Low lube oil pressure. High jacket cooling temperature. c) Generator reverse power. d) Generator overcurrent. e) Generator loss of field. f) Engine cranking lockout. g) At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting diesel generators 0, 2A, and 2B simultaneously\*, during shutdown, and verifying that all three diesel generators accelerate to 900 rpm  $\pm 5$ , -2% in less than or equal to 13 seconds. At least once per 10 years by: Draining each fuel oil storage tank, removing the accumulated 1. sediment and cleaning the tank using a sodium hypochlorite or equivalent solution, and Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND, of the 2. ASME Code in accordance with ASME Code Section 11. Article IWD-5000. 4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.6.C within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. If the number of failures in the last 100 valid tests, on a per nuclear unit basis, is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position c.3.b of Regulatory Guide 1.108, Revision 1, August 1977. See T3UP 4.9.8 Ser pherman Nate (a) \*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer. LASALLE - UNIT 2

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### FOR INFORMATION ONLY



Amendment No. 56

FOR INFORMATION ONLY

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3/4.8.1 A.C. SOURCES

A.C. SOURCES - OPERATING

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 IE distribution system, and
- b. Two separate and independent diesel generators, each with:
  - 1. Separate day and engine mounted fuel tanks containing a minimum of (250) gallons of fuel,
  - 2. A separate fuel storage system containing a minimum of (26,000) gallons of fuel, and
  - 3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION: -

- a. With either one offsite circuit or one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and 4.8.1.1.2.a.4, for one diesel generator at a time, within one hour and at least once per 8 hours thereafter; restore at least two offsite circuits and both of the above required diesel generators to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- b. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and 4.8.1.1.2.a.4 within one hour and at least once per 8 hours thereafter; restore at least one of the above required inoperable A.C. sources to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and both of the above required diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in CQLD SHUTDOWN within the following 24 hours.



LIMITING CONDITION FOR OPERATION (Continued)

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#### ACTION (Continued)

- c. With one diesel generator of the above required A.C. electrical power sources inoperable, in addition to ACTION a or b, above, verify within 2 hours that all required systems, subsystems, trains, components and devices that depend on the remaining diesel generator as a source of emergency power are also OPERABLE; Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- d. With two of the above required offsite circuits inoperable, demonstrate the OPERABILITY of both of the above required diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4, for one diesel generator at a time, within one hour and at least once per 8 hours thereafter, unless the diesel generators are already operating; restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- e. With both of the above required diesel generators inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore at least one of the above required inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore both of the above required diesel generators to OPERABLE status within 72 hours from time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- f. With one supply train of the Diesel Fuel Oil Storage and Transfer System inoperable, restore the inoperable system to OPERABLE status within 72 hours or be in at least HDT STANDBY within the next 6 hours and be in HOT SHUTDOWN within the following 6 hours.

g. With both supply trains of the Diesel Fuel Oil Storage and Transfer System inoperable, restore at least one supply train, including the common storage system, to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and be in COLD SHUTDOWN within the following 30 hours.



FOR INFORMATION ONLY (k

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring, manually and automatically, unit power supply from the normal circuit to the alternate circuit.
- .8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

In accordance with the frequency specified in Table 4.8.1.1.2-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day and engine-mounted fuel tanks.

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- Verifying the fuel level in the fuel storage tank.
- 3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day and engine-mounted fuel tanks.

Verifying the diesel starts from ambient condition and accelerates to at least (900) rpm in less than or equal to (13) seconds. The generator voltage and frequency shall be (4160)  $\pm$  (420) volts and (60)  $\pm$  (1.2) Hz within (13) seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

a) Manual.

b.

- b) Simulated loss of offsite power by itself.
- c) Simulated loss of offsite power in conjunction with an ESF actuation test signal.

X

- d) An ESF actuation test signal by itself.
- 5. Verifying the diesel generator is synchronized, loaded to greater than or equal to (continuous rating) kw in less than or equal to (60) seconds, and operates with this load for at least 60 minutes.
- Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- (7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to (250) psig.)  $\sqrt{}$

At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day and engine-mounted fuel tanks.

\*The diesel generator start  $(\dot{1}\dot{9}$  sec) and subsequent loading (60 sec) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts and loading for the purpose of this surveillance testing are not required to meet the '10' sec and/60 sec)fast start criteria and may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical stress and wear on the diesel engine is minimized.

### FOR INFORMATION ONLY

#### SURVEILLANCE REQUIREMENTS (Continued)

- c. At least once per (31 [if ground water table is equal to or higher than the bottom of the tank]) (92) days by removing accumulated water from the fuel storage tank(s).
- d. At least once per 92 days and from new fuel oil prior to addition to the storage tanks by obtaining a sample in accordance with ASTM-D270-1975 and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:
  - 1. As soon as sample is taken or from new fuel prior to addition to the storage tank, as applicable, verify in accordance with the tests specified in ASTM-D975-77 that the sample has:
    - a) A water and sediment content of less than or equal to,
       0.05 volume percent.
    - A kinematic vixcosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.
    - c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to \_\_\_\_\_\_ but less than or equal to \_\_\_\_\_\_ or as API gravity @ 60°F of greater than or equal to \_\_\_\_\_\_ degrees but less than or equal to \_\_\_\_\_\_ degrees.
  - /2. Within one week after obtaining the sample, verify an impurity level of less than 2 mg of insolubles per 100 ml. when tested in accordance with ASTM-D2274-70.
  - 3. Within two weeks after obtaining the sample, verify that the other properties specified in Table 1 of ASTM-D975-77 and Regulatory Guide 1.137, Position 2.a, are met when tested in accordance with ASTM-D975-77.
- e. At least once per 18 months, during shutdown, by:
  - 1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
  - 2. Verifying the diesel generator capability to reject a load of greater than or equal to (largest single emergency load) kW for diesel generator (lA) and greater than or equal to (largest single emergency load) kW for diesel generator (lB) while maintaining *X*voltage at (4160) ± (420) volts and frequency at (60) ± (1.2) Hz}.
    Kengine speed < 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is less).</p>

#### ELECTRICAL POWER SYSTEMS

#### SURVEILLANCE REQUIREMENTS (Continued)

- 3. Verifying the diesel generator capability to reject a load of (continuous rating) kW without tripping. The generator voltage shall not exceed (4784) volts during and following the load rejection.
- Simulating a loss of offsite power by itself, and:
  - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
  - b) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within (13) seconds, energizes the autoconnected (shutdown) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at (4160)  $\pm$ (420) volts and (60)  $\pm$  (1.2) Hz during this test.
- 5. Verifying that on an ECCS actuation test signal, without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be (4160)  $\pm$  (420) volts and (60)  $\pm$  (1.2) Hz within (13) seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.
- 6. Verifying that on a simulated loss of the diesel generator, with offsite power not available, the loads are shed from the emergency busses and that subsequent loading of the diesel generator is in accordance with design requirements.
- 4.7. Simulating a loss of offsite power in conjunction with an ECCS actuation test signal, and:
  - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
  - b) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within (13) seconds, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at (4160) ± (420) volts and (60) ± (1.2) Hz during this test.
- 7 S. Verifying that all automatic diesel generator trips, except (engine overspeed and generator differential current) are automatically bypassed upon loss of voltage on the emergency bus concurrent with an ECCS actuation signal.

### FOR INFORMATION ONLY

#### SURVEILLANCE REQUIREMENTS (Continued

- 9. Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to (2-hour rating) kW and during the remaining 22 hours of this test, the diesel generator shall be loaded to (continuous rating) kw. The generator voltage and frequency shall be (4160)  $\pm$  (420) volts and (60)  $\pm$  (1.2) Hz within (13) seconds after the start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.e.4.b).\*
  - 10. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of ( ) kW.
  - 11. Verifying the diesel generator's capability to:
    - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
    - b) Transfer its loads to the offsite power source, and
    - c) Be restored to its standby status.

. . . . . . . . . . . . . . . .

- 12. Verifying that with the diesel generator operating in a test mode and connected to its bus, a simulated ECCS actuation signal overrides the test mode by (1) returning the diesel generator to standby operation, and (2) automatically energizes the emergency loads with offsite power.
- (13. Verifying that with all diesel generator air start receivers pressurized to less than or equal to (250) psig and the compressors secured, the diesel generator starts at least 5 times from ambient conditions and accelerates to (900) rpm ± 3% in less than or equal to (13) seconds.)
- 14. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day and engine-mounted tanks of each diesel via the installed cross connection lines.
- 13 JS.
  - 5. Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within ± 10% of its design interval.

If Surveillance Requirement 4.8.1.1.2.e.4.b is not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test. Instead, the diesel generator may be operated at (continuous rating) kw for one hour or until operating temperature has stabilized.

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#### ELECTRICAL POWER SYSTEMS

#### SURVEILLANCE REQUIREMENTS (Continued)

- 16. Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
  - a) (Turning gear engaged.)
  - b) (Emergency stop.)
- f. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least (900) rpm in less than or equal to (13) seconds.
- g. At least once per 10 years by:
  - Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a (sodium hypochlorite) solution, and
  - 2. Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code in accordance with ASME Code Section 11 Article IWD-5000.

4.8.1.1.3 <u>Reports</u> - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.9.1. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. If the number of failures in the last 100 valid tests, on a per nuclear unit basis, is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

#### TABLE 4.8.1.1.2-1

#### DIESEL GENERATOR TEST SCHEDULE

Number of Failures in Last 100 Valid Tests*	Test Frequency			
<u>&lt;</u> 1	At least once per 31 days			
2	At least once per 14 days			
3	At least once per 7 days			
<u>&gt;</u> 4	At least once per 3 days			

\*Criteria for determining number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, August 1977, where the last 100 tests are determined on a per nuclear unit basis. For the purposes of this test schedule, only valid tests conducted after the OL issuance date shall be included in the computation of the "last 100 valid tests." Entry into this test schedule shall be made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the made at the 31 day test frequency. Wath the structure of the structure of the made at the 31 day test frequency.



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### FOR INFORMATION ONLY

#### A.C. SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

A. One circuit between the offsite transmission network and the onsite Class IE distribution system, and

One diesel generator with: 2 205 A\* day and engine mounted fuel tanks containing a minimum of (250) gallons of fuel. - Zvailslike bulk A fuel storage system containing (a minimum of (31,000) gallons of fuel. (vzileble 5 10,000 A fuel transfer pump. APPLICABILITY: OPERATIONAL CONDITIONS 4, 5 and (\*).

ACTION:

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a. With less than the above required A.C. electrical power sources OPERABLE, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment, operations with a potential for draining the reactor vessel and crane operations over the spent fuel storage pool when fuel assemblies are stored therein. In addition, when in OPERATIONAL CONDITION 5 with the water level less than (23) feet above the reactor pressure vessel flange, immediately initiate corrective action to restore the required power sources to OPERABLE status as soon as practical.

4,9.1

9. A. Z.9

b. The provisions of Specification 3.013 are not applicable.

MODE(S)

SURVEILLANCE REQUIREMENTS

4.8.1.2 At least the above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1, 4.8.1.1.2, and 4.8.1.1.3, except for the requirement of 4.8.1.1.2.a.5.

"When handling irradiated fuel in the secondary containment.

ELECTRICAL POWER SYSTEMS FOR INFORMATION ONLY 9.0) 3/4.8.2) D.C. SOURCES D.C. SOURCES - OPERATING LIMITING CONDITION FOR OPERATION í,C 3.8.2.1) As a minimum, the following D.C. electrical power sources shall be with the limits specified in Table 4.9.C-1. OPERABLE; Division (1), consisting of? 1. Two station 250 volt ballenes, each with a 1. 125 volt battery (1A). T)->(J. 2. Two station as rolt batteries, 2. 125 volt full capacity charger. each with & feel cofocity cheerger. 3: One unit 24/48, voit billey, with Donle Division (2), consisting of: ь. 2 full cojacity charger. 125 volt battery (1B). 1. 2. 125 volt full capacity charger. APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3. MODE(s) ACTION: With either Division (1) or Division (2) battery and/or charger of the above required D.C. electrical power sources inoperable, restore the inoperable division battery to OPERABLE status within 2 hours or be in at q.C ACTUNS least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. 24/48 welt. 2.50 valt on SURVEILLANCE REQUIREMENTS q.Ć Each of the above required #125-volt batteries and chargers shall be 4.8.2.1 demonstrated OPERABLE:  $\left( \left( 2\right) \right)$ At least once per 7 days by verifying that: (u, q, c-1)The parameters in Table (4.8.2.1-1) meet the Category A limits, and Total battery terminal voltage is greater than or equal to /(129)-volts on float charge, 21.7, 105 05210) At least once per 92 days and within  $7\frac{1}{2}$  days after a battery discharge <u>\_(р)</u> 2 with battery terminal voltage below (110)-volts, or battery overcharge with battery terminal voltage above (150)-volts, by verifying that: (30,150 or 300) The parameters in Table (4.8.2.1-1) meet the Category B limits, econord valor velo, 25 200, 2260, 2260, 28 200, 2260, 20 125,9, 22,00 125,9, 20,00  $\hat{\mathcal{Q}}_{\mathcal{T}}$  There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than Ģ lor = 20% above baseline connection resistance, whichever  $(150 \times 10^{-6})$  ohms, and The average electrolyte temperature of (a representative number) (3). of connected cells is above  $(060^{\circ}F)$ . lover Little cell

#### ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

At least once per 18 months by verifying that: The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material, The resistance of each cell (-to-cell) and terminal connection is less than or equal to (150 x 10-6) ohms, and (1208 show baseline connection restrictione is higher is higher is higher The battery charger/will supply/at least ( ) amperes at a minimum of ( ) volts for at least (4) hours. alocd equil to the At least once per 18 months, during shutdown, by verifying that / manufacturers retive (or simulated ceither? The battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for the design duty cycle when the battery is subjected to a battery service test. or The battery capacity is adequate to supply a dummy load of the 2. following profile while maintaining the battery terminal voltage greater than or equal to ( ) volts. Battery (1A), greater than or equal to ( ) amperes and a) battery (1B), greater than or equal to ( the initial 60 seconds of the test. ) amperes during Battery (1A), greater than or equal to ( ballery (IA), greater than or equal to ( ) amperes and battery (IB), greater than or equal to ( ) amperes during the remainder of the first barries of the f b) the remainder of the first hour of the test. ) amperes and c) Battery (1A), greater than or equal to ( battery (1B), greater than or equal to ( ) amperes during the remainder of the (8) hour test. At least once per 60 months during shutdown by verifying that the battery capacity is at least 80% of the manufacturer's rating/when subjected to a performance discharge test. At this once per/60 month interval, this performance discharge test may be performed in lieu of the battery service test. At least once per 18 months during shutdown performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service Tife expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

TABLE \$4.8.2.

#### BATTERY SURVEILLANCE REQUIREMENTS

CATEGORY A(1) CATEGORY Allowable Parameter Limits for each Limits for each designated pilot connected cell value for each cell connected cell Electrolyte >Minimum level >Minimum level Above top of indication mark. indication mark. Level plates. and < 눟" above maximum level and < ¼" above and not maximum level overflowing indication mark indication mark  $\geq$  2.13 volts<sup>(c)</sup> Float Voltage > 2.13 volts 2.07 volts Not more than .020 below the average of all connected cells ≥ ((1.200))(b) Specific Gravity<sup>(a)</sup> Average of all Average of all connected cells connected, cells > ((()1.205()) 🐺 > (01.1950) <sup>(a)</sup>Corrected for electrolyte temperature and level. (b) Or battery charging current is less than (2) amperes when on float charge. (C) May be corrected for average electrolyte temperature. For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE, provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits I HS 2550 citted charger & OPERABLE an within the next 6 days. (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE, provided that the Category B parameters are a within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days. (3) Any Category B parameter not within its allowable value indicates an inoperable battery. Numbers in parentheses assume a manufacturer's recommended full charge specific gravity of 1.215.

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ACTIONIG

FOR INFORMATION ONLY ELECTRICAL POWER SYSTEMS The following P.C. electrical D.C. SOURCES - SHUTDOWN LIMITING CONDITION FOR OPERATION q,D 3.8.2.2 As a minimum, Division (1) or Division (2) of the D.C. electrical power sources system shall be OPERABLE with: One station 250 walt balling with a full capacity charge Division (1) consisting of: 125 volt battery (1A). 1. 125 volt full capacity chargen 2. One station 25 voit balley with a full copacity charger. 2. Division (2) consisting of: b. 3. One and 24/48 rolt balter, with a full coperity charger. 125 volt battery (1B). 1. 125 volt full capacity charger 2. APPLICABILITY: OPERATIONAL CONDITIONS 4, 5 and MODE(S) Cany of the above required station ACTION: With Tess than the Division (1) and/or Division (2) battery and/or with charger of the above required D.C. electrical power sources OPERABLE; e suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary Inspirable containment and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.3 are not applicable. b. SURVEILLANCE REQUIREMENTS 4.8.2.1 At least the above required battery and charger's hall be demonstrated ゆの OPERABLE per Surveillance Requirement 4.8.2.1.>-(2) When handling irradiated fuel in the secondary containment. See TSrup 4,9. D, foatnote (a) 3/4 8-13 GE-STS (BWR/4)

	ELECTRICAL PO	WER SYSTEMS	FOR INFO	RMATION	ÔNIY
·g,E	3/4.18.3 ONSI	TE POWER DISTRIBUTION	SYSTEMS		
	DISTRIBUTION	- OPERATING			
	LIMITING COND	ITION FOR OPERATION	······		
· <u>q</u> e	3.8.3.) The with tie bread between units	following power distri kers open ((both) betwee at the same station):	bution system div en redundant buse	isions shall s within the	be energized unit (land
( <u>])</u> ×	a. A.C. pow	er distribution:			- P
	1. Div	ision (1), consisting	of:	کے ک	2.9.E.1,2,3,4
	a) b) c)	4160 volt A.C. bus ( 480 volt A.C. MCCs ( 120 volt A.C. distri and	). and). bution panels in _).	(480 volt MCC	s_,
	2. Div	ision (2), consisting	of:		
	a) b) c)	4160 volt A.C. bus ( 480 volt A.C. MCCs ( 120 volt A.C. distri , and	). and ). bution panels in _).	(480 volt MCC	s,
	b. D.C. powe	er distribution:			
	1. Dřv 2. Div	ision (1), consisting ision (2), consisting	of 125 volt D.C. of 125 volt D.C.	distribution distribution	panel ( ). panel ( ).
1	APPLICABILITY:	OPERATIONAL CONDITI Mode	ONS 1, 2 and 3.		
_	() A. With not at with	n one of the above req energized, re-energiz least HOT SHUTDOWN wit nin the following 24 h	uired A.C. distri e the division wi hin the next 12 h ours.	bution system thin 8 hours ours and in C	divisions or be in . DLD SHUTDOWN
- (3	b. With not leas with	n one of the above req energized, re-energiz st HOT SHUTDOWN within nin the following 24 h	uired D.C. distri e the division wi the next 12 hour ours.	bution system thin 2 hours s and in COLD	divisions or be in at SHUTDOWN
	SURVEILLANCE	REQUIREMENTS			
9,5	4:8.3. Each be determined alignment and	of the above required energized at least on voltage on the busses	power distribution ce per 7 days by /MCCs/panels.	on system div verifying cor	isions shall . rect breaker _
	GE-STS (BWR/4)	)	3/4 8-14		

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FOR INFORMATION ONLY ELECTRICAL POWER SYSTEMS the following DISTRIBUTION - SHUTDOWN q.F LIMITING CONDITION FOR OPERATION 3 8.3.2) As a minimum, Division (1) or Division (2) of the power distribution system shall be energized with: A.C. power distribution: 75 UM 3.9,F.1, 2,3 Sel Division (1) consisting of:  $\leq$ 4160 volt A.C. bus ( a) b) 480 wolt A.C. MCCs ( and 120 volt A.C. distribution panels in (480 volt MCCs c) and 2. Division (2) consisting of: 4160 volt A.C. Dus ( 480 volt A.C. MCCs ( a) b) and 120 volt A.C. distribution panels in (480 volt MCCs c) and D.C. power distribution: ь. 1. Division (1) consisting of 125 volt D.C. distribution panel ( ). Division (2) consisting of 125 volt D.C. distribution panel ( ). APPLICABILITY: OPERATIONAL CONDITIONS 4, 5 and 🗫 (D.C) MODE(S) ACTION: With less than Division (1) and/or Division (2) of the above required (a) A.C. distribution system energized, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel. With less than Division (1) and/or Division (2) of the above required Ь. D.C. distribution system energized, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.3 are not applicable. SURVEILLANCE REQUIREMENTS 9,F e le Eschof 4.8.3.2 At least the above required power distribution system divisions shall be determined energized at least once per 7 days by verifying correct breaker alignment and voltage on the busses/MCCs/panels. When handling irradiated fuel in the secondary containment.

#### ELECTRICAL POWER SYSTEMS

#### REACTOR PROTECTION SYSTEM ELECTRICAL POWER MONITORING

#### LIMITING CONDITION FOR OPERATION

3.8.4.4 Two RPS electric power monitoring channels for each inservice RPS MG set or alternate power supply shall be OPERABLE.

(MODE(5) 1,2,3,4<sup>(2)</sup>, duel 5 APPLICABILITY: At all times

ACTION:

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With one RPS electric power monitoring channel for an inservice RPS MG set or alternate power supply inoperable, restore the inoperable power monitoring channel to OPERABLE status within 72 hours or remove the associated RPS MG set or alternate power supply from service.

With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one electric power monitoring channel to OPERABLE status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.

SURVEILLANCE REQUIREMENTS

4.8.4.) The above specified RPS electric power monitoring channels shall be determined OPERABLE:

At least once per 6 months by performance of a CHANNEL FUNCTIONAL TEST. а. and

> By performance of a CHANNEL FUNCTIONAL TEST Each time the

plant is in COLD SHUTDOWN for 2 period & more than 24 bans, unless priformed in the previous

le monito.

- b. At least once per 18 months by demonstrating the OPERABILITY of over-voltage, under-voltage, and under-frequency protective instrumentation by performance of a CHANNEL CALIBRATION including simulated automatic actuation of the protective relays, tripping logic and output circuit breakers and verifying the following setpoints. 12916
  - Over-voltage < (132) VAC, 1.
  - 2. Under-voltage > (108) VAC,
  - 3. Under-frequency > (57) Hz.

Any with any contral roch withdrawn\_ 2

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