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Nuclear Operations

October 2, 1995
NRC-95-0104

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) Detroit Edison letter to NRC, "Request for Discretionary Enforcement," NRC-95-0091, dated September 29, 1995

3) Detroit Edison letter to NRC, LER 94-003-03, "Inadequate Logic Functional Test," NRC-95-0015, dated March 17, 1995

4) Detroit Edison letter to NRC, "Revision to Request for Discretionary Enforcement," NRC-95-0105, dated October 2, 1995

Subject: Proposed Emergency Technical Specification Change (License Amendment) - Deferral from Limited Aspects of Surveillance Requirements 4.3.3.2, 4.8.1.1.2.e.4.b, and 4.8.1.1.2.e.6.b

Pursuant to 10CFR50.90, Detroit Edison Company hereby proposes to amend Operating License NPF-43 for the Fermi 2 plant by incorporating a one-time deferral of limited aspects of Surveillance Requirements 4.3.3.2, 4.8.1.1.2.e.4.b and 4.8.1.1.2.e.6.b into the plant Technical Specifications. Detroit Edison requests this change be processed under the provisions of 10 CFR50.91.(a)(5) as an emergency situation, since failure to act in a timely way would result in an unnecessary shutdown of Fermi 2.

On September 29, 1995, Detroit Edison requested discretionary enforcement (Reference 2) to obtain deferral from limited aspects of surveillance requirements which may not have been adequately completed so that surveillance testing can be completed for the affected components in an orderly manner. The request was subsequently revised in Reference 4.

The enforcement discretion was requested until an emergency Technical Specification change is approved. This submittal provides the emergency

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Technical Specification (TS) change request committed to be submitted by October 3, 1995. The NRC verbally approved the enforcement discretion on September 29, 1995 at 1635 hours.

The description of the specific limited aspects of testing being deferred due to potentially incomplete control switch and relay contact position verification during surveillance testing is contained in Attachment 1. The circumstances surrounding this request, evaluation of why the Emergency Diesel Generators will continue to perform their safety function, and explanation why this emergency situation occurred are discussed in Attachment 1. Attachment 2 contains the proposed Technical Specification revisions to defer completion of the specified aspects of the surveillances until the first plant outage after September 29, 1995.

The following commitment made in References 2 and 4 is being restated in this letter. Detroit Edison will complete the remainder of the surveillance testing no later than during the first plant outage after September 29, 1995. Detroit Edison will evaluate whether performing any of the testing on-line is consistent with prudent risk management.

Detroit Edison has evaluated the proposed TS change against the criteria of 10CFR50.92 and determined that no significant hazards consideration is involved. The Fermi 2 Onsite Review Organization has approved, and the Nuclear Safety Review Group has reviewed, the proposed TS and concurs with the enclosed determinations. In accordance with 10CFR50.91, Detroit Edison has provided a copy of this letter to the State of Michigan.

If you have any questions, please contact Ms. Lynne Goodman at (313) 586-4097.

Sincerely,

Paul Fessler

Attachments

cc: T. G. Colburn
H. J. Miller
M.P. Phillips
A. Vegel
Supervisor, Electric Operators, Michigan
Public Service Commission - J. R. Padgett

I, PAUL FESSLER, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

Paul Fessler

PAUL FESSLER
Plant Manager

On this 2nd day of October, 1995 before me personally appeared Paul Fessler, being first duly sworn and says that he executed the foregoing as his free act and deed.

Rosalie A. Armetta

Notary Public

ROSALIE A ARMETTA
NOTARY PUBLIC STATE OF MICHIGAN
MONROE COUNTY
MY COMMISSION EXP. NOV. 20,1995

ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGE
(LICENSE AMENDMENT)

ONE-TIME DEFERRAL FROM
LIMITED ASPECTS OF SURVEILLANCE TESTING

INTRODUCTION AND BASIS FOR EMERGENCY CIRCUMSTANCES

At 1700 hours on September 28, 1995, all four emergency diesel generators were declared inoperable due to missed Technical Specification (TS) surveillance requirements due to incomplete control switch and relay contact position verification during surveillance testing.

Detroit Edison evaluated the condition and, since the potentially untested portions of the logic circuitry did not, and would not, prevent the surveillance testing which has been performed from demonstrating that the emergency diesel generators are functional and would perform the safety functions if needed, and that there was no potential adverse impact on the public health and safety, Detroit Edison requested enforcement discretion (Reference 2). The enforcement discretion request was submitted to obtain deferral from limited aspects of surveillance requirements which had not been adequately completed so that surveillance testing could be completed for the affected components in an orderly manner. The enforcement discretion was requested to begin at 1700 hours on September 29, 1995, and to remain in effect until an emergency Technical Specification change is approved. Furthermore, Detroit Edison committed to completing surveillance requirements during the next plant outage. In addition, Detroit Edison is evaluating whether performing on-line testing is consistent with prudent risk management.

If the NRC had not granted the request for discretionary enforcement, a reactor shutdown would have been required. To conduct the required surveillance testing, all four diesel generators would have been required to be removed from service in a sequential manner so that the associated output breaker closure switch could be manipulated. In addition, various safety related system components would have needed to have been taken out of service to perform verification that the load sequencing control relay contacts are operating properly.

At 1635 hours on September 29, 1995, the NRC granted the enforcement discretion request.

Detroit Edison is proposing that Technical Specification sections 4.3.3.2, 4.8.1.1.2.e.4.b, and 4.8.1.1.2.e.6.b be amended to defer a portion of the logic system functional test surveillance requirements related to emergency diesel generator output breaker re-closure circuitry that is initiated following a load shed, and to defer portions of the emergency 480-volt Motor Control Center (MCC) load sequencer surveillance testing requirements until the next plant outage.

Since Fermi 2 is presently operating under discretionary enforcement, Detroit Edison believes that this request represents emergency circumstances as described in 10CFR50.91(a)(5).

Electrical surveillance overlap drawings were created as a result of Licensee Event Report (LER) 94-003, "Inadequate Logic Functional Test" (Reference 3). An independent review was performed in conjunction with the development of these overlap drawings. This review identified concerns of contact ambiguity with regard to certain portions of the diesel generator output breaker and 480-volt emergency bus load sequencer surveillance tests. These concerns were reviewed and found to be valid by Fermi 2 engineering personnel on September 28, 1995. The review determined that contacts in parallel with the contacts intended to be functionally tested are not verified to be open. This could hypothetically result in a false satisfactory test of the contact function. Therefore, this situation was a direct result of the review to improve documentation of required electrical system surveillance testing. This situation could not be avoided because Fermi 2 is aggressively reviewing and documenting overlap requirements and is conservatively assuming that hypothetical contact failures could mask otherwise apparently successful surveillance testing.

The information contained within this document provides the background for the condition and the justification and evaluation for granting an emergency Technical Specification change.

BACKGROUND

The potentially affected contacts fall into two general categories, the diesel generator output breaker re-closure circuitry that is initiated following a load shed, and the emergency 480-volt load sequencer control relay contacts.

Diesel Generator Output Breaker Re-Closure Circuitry

TS Surveillance 4.3.3.2, "Emergency Core Cooling System Actuation Instrumentation," requires verifying that logic system functional tests and simulated automatic operation of all channels shall be performed at least once per 18 months. Loss of power (4160-volt bus loss of voltage or degraded voltage) is one of the functions that is tested as part of this surveillance requirement. Failure to meet the minimum operable channels results in entry to TS 3.8.1.1 for onsite power system inoperabilty. The associated surveillance test procedure involves tripping of the output breaker and verifies that the associated output breakers trip, initiating a load shed followed by the re-closure of the associated output breaker. The associated bus load shedding

logic contacts close to re-energize the output breaker closing coil permissive relay (relay 52XX). Closure of one of the 52XX relay contacts, coincident with other breaker closure signals, results in closure of the breaker. However, this testing does not verify that the parallel control room breaker closure (CMC) switch contacts, or the 52XX relay seal-in contacts, are not responsible for the re-energizing of the 52XX relay. The surveillance test procedure has the CMC switch in the required position which should result in the associated CMC switch contact being open, and the 52XX relay dropping out, however, there is no positive verification that these contacts are not in fact closed (i.e., stuck). Refer to the attached sketch for a sample schematic representation.

Emergency 480-volt Load Sequencer Control Relay Contacts

TS Surveillances 4.8.1.1.2.e.4.b and 4.8.1.1.2.e.6.b require verifying that the diesel generator starts on the auto-start signal and energizes the emergency busses with automatically connected loads through the load sequencer. The associated surveillance test procedure involves verification that the auto-connected loads are running on the 480-volt emergency busses after the diesels automatically start. However, this testing does not verify that the automatic digital load sequencer system sequencing relays are responsible for actually closing the associated loads. There are parallel control switch contacts and/or control relay contacts that could provide for immediate connection of the loads to the 480-volt emergency bus after diesel generator starting without a closure signal from the load sequencer system. The sequence of surveillance testing establishes the conditions to open these parallel contacts, but does not include positive verification that the parallel contacts are actually open. Refer to the attached sketch for a sample schematic representation.

Failure to provide positive verification that the proper logic path has provided the energization of the relay coils as described above resulted in the diesel generators being inoperable in accordance with TS 3.8.1.1. TS 3.8.1.1 requires two separate and independent onsite A.C. electrical power sources, Division I and Division II, each consisting of two emergency diesel generators. TS 3.8.1.1, Action d, states that with both of the required onsite A.C. electrical power divisions inoperable, restore at least one of the above required inoperable divisions to operable status within 2 hours or be in at least hot shutdown within the next 12 hours and cold shutdown within the following 24 hours.

EVALUATION

4160-volt ESF busses are equipped with undervoltage relaying. This relaying will initiate a load shed sequence to remove pre-determined electrical loads from the associated busses. The same relaying will automatically initiate an emergency diesel generator start. Once started, the diesel generator output breaker will close. An automatic sequencer then controls the rate of loading on the busses connected to the diesel generator to ensure that the required loads are reenergized and to prevent a diesel generator overload that otherwise would be caused by the combined starting currents of all the components powered by that bus should they all start concurrently.

The logic associated with the undervoltage relaying, the loads and logic associated with the loss of offsite power, and the diesel generator start logic were all tested during the last refueling outage that ended in January, 1995.

The existing surveillance test procedures do not provide positive verification that the proper logic path has provided the energization of the relay coils associated with neither the diesel generator re-closure circuitry nor the 480-volt emergency bus load sequencer control relay logic circuitry.

Diesel Generator Output Breaker Re-Closure Circuitry

For the testing deficiencies associated with the diesel generator output breaker logic, the function of the inadequately tested contact is not needed (function bypassed) when the output breaker CMC switch is in the OPEN position, the normal plant operations state. Further, any hypothetical failure of the subject contacts could have gone undetected during the surveillance testing only if a parallel contact in the output breaker CMC switch or the 52XX relay had failed closed. If this had occurred, the output breaker would still function as needed because the 52XX relay would energize via the failed closed parallel contact(s) and provide the required breaker closing coil permissive logic.

The 52XX relay provides anti-pumping protection for the circuit breaker. Anti-pumping is a feature of an electrically operated circuit breaker whereby repeated closing and tripping, pumping, is prevented after a breaker closure signal is initiated and the circuit breaker closes into a fault. For the Fermi 2 circuit breakers, a shunt contact is connected across the 52XX relay coil such that the shunt contact closes whenever the circuit breaker closes, thereby shorting out the relay coil causing the relay to drop out. This scenario resets the circuit breaker circuitry in preparation for a circuit breaker reclosure attempt in the event of a loss of offsite power. Therefore, in the event that either the 52XX seal-in contact or the CMC "open" contact are welded in the closed position (i.e., situation

necessary for the undervoltage load shed contact surveillance test function to have been masked), there is no adverse impact on the operation of the diesel generator output breaker since the 52XX relay coil shunt contact configuration is unaffected by this situation.

Emergency 480-volt Load Sequencer Control Relay Contacts

For the inadequately tested load sequencer contacts, any hypothetical failure of the subject contacts could have gone undetected during the surveillance testing only if a parallel contact in the associated CMC control switch or control relay contact had failed closed and had not been detected. If this had occurred, the associated load would still function as needed because the logic would be completed via the failed closed parallel contact(s) and the 480-volt emergency bus loads would load onto the bus when the diesel breaker closes. In addition, since the surveillance testing did verify that the diesels were able to respond adequately to the connection of all loads, any failure which had not been detected during previous testing has had no impact on the function of the diesels.

For the 480-volt load sequencers, in the worst case, if one of the parallel contacts was welded closed, the associated load would operate if needed to perform its safety function. The only consequence of a welded closed parallel contact would be that the 480-volt load would be connected to the diesel generator immediately upon closing of the diesel generator output breaker, instead of being delayed in groups by the load sequencer for certain time periods (usually 5 or 10 seconds) after the diesel generator output breaker closes.

In a worst case, highly improbable scenario, represented by concurrent failure of all of the incompletely tested contacts (up to 15 individual contacts on 15 separate loads per diesel generator), approximately 185 hp of additional load connected at the 480-volt bus level would be immediately connected to the most highly loaded diesel generator when the diesel generator output breaker closes. Refer to Table No. 1 for a listing and description of the loads. Engineering evaluations have judged that the diesels are capable of accepting the simultaneous connection of all of the additional loads coincident with other loads being sequenced onto an individual diesel generator when the diesel output breaker closes. This evaluation is based, in part, on pre-operational testing when a core spray pump and a residual heat removal pump were simultaneously loaded onto the diesel generator (approximately 800 hp, at the 4160-volt bus level, above normal sequenced loading).

An engineering evaluation has also been conducted based on the effects to individual connected loads as a result of adding the additional block loading at the time the diesel generator output breaker is closed. The evaluation determined the

change in voltage drop and recovery time would not adversely affect plant equipment. The change in voltage dip for a short time will not damage the individual components, motor operated valves and continuous duty motors that start when the diesel generator output breaker closes. The resulting individual component terminal voltage and overall voltage recovery time are acceptable. There is no impact on the undervoltage and degraded [illegible]1 relay setting. The results of these evaluations indicate that all individual loads connected to the diesel generators would perform their required safety function in the required time with no adverse effects or consequences.

As part of the investigation into the consequences of the potential incomplete control switch and contact position verification during surveillance testing, a problem and failure history search was performed for the components integral to the diesel generator load shed and load sequencing logic. The specific components evaluated were the relays used as "N94" devices in the load shedding strings, the relays used in the circuit breakers as the 52XX permissive device, the relays used in the load sequencing logic as "XK" devices, the relays used as permissive "CR1" devices in the motor control center load circuits, control relays used to multiply the load sequencer logic signal, and the remote control CMC switches for circuit breaker operations. Various sources of information, dating back 10 years, were used to determine the failure mechanisms and frequencies for these components. The scope of the search included Fermi 2 specific preventive maintenance activities and in-service failures, and industry reported failures to NPRDS. The results of this investigation determined that given the relatively large population of these components, as well as the number of operations they have been subjected to, the overall failure rates involving stuck closed contacts are very low.

Based on successful operation of the diesel generators during the last refueling outage and the monthly surveillance testing, and the industry and Fermi 2 history of high reliability for the associated control switches and relay contacts, Detroit Edison is confident that the diesel generators are fully functional as tested.

SIGNIFICANT HAZARDS CONSIDERATION

In accordance with 10CFR50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards considerations. To make this determination, Detroit Edison must establish that operation in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety.

The proposed amendment will allow Fermi 2 to defer limited aspects of surveillance requirements related to the emergency diesel generator output breaker re-closure circuitry that is initiated following a load shed, and the emergency 480-volt load sequencer control relay contacts that connect select 480-volt loads to the diesel generators in a timed sequence after the diesel generator output breaker closes.

1. The proposed changes do not involve an increase in the probability or consequences of an accident previously evaluated. There is no change to the underlying accident and transient analysis to support operation of Fermi 2. The components involved for which testing is being deferred are not associated with any accident initiation mechanism. Further, testing that has been completed in conjunction with engineering analysis has shown that the diesel generators will still perform their safety function. Therefore, there is no effect on the probability or consequences of any accident.

2. The proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated. The affected components are associated with components in the A.C. emergency power system. This system is normally in standby mode and thus not operating. Since the scope of this change does not affect the initiation of this standby feature, the change has no impact on normal plant operation and thus does not involve a new or different accident scenario.

3. The proposed changes do not involve a reduction in a margin of safety. The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumption. The proposed change does not alter the ability of the emergency A.C. power system to respond and perform its function nor does the proposed change affect any instrument setpoints or design margins. The testing performed in conjunction with engineering analysis demonstrates that the diesel generators can perform their safety functions. Therefore, the change does not involve a reduction in the margin of safety.

Furthermore, the proposed changes do not increase the probability of a malfunction of equipment important to safety, nor create the possibility of a different type of malfunction of equipment important to safety. As evidenced by the review of industry and Fermi 2 specific failure history, the components associated with the logic circuitry have a very low failure rate for contacts to stick closed. Therefore, Detroit Edison expects that the testing that has been performed

has actually tested the portions of the circuits that are required to be tested by the associated surveillance requirements.

Even if the parallel contacts that may be masking the desired logic circuit function are in a failed closed condition, there are no adverse consequences on the associated components or systems. If the load sequencer output contacts have not been tested by the surveillance testing performed, then the load sequencer contacts are not expected to be required to function during a loss of offsite power since they will be masked by the failed closed contacts connected in parallel in the circuit. This is also the configuration that would have been tested during the last performance of the associated surveillance test. Engineering evaluation has shown that the potentially changed load profile will not affect the powered equipment. Therefore, all equipment important to safety will properly function.

Based upon the above, Detroit Edison has concluded that the proposed change does not involve a significant hazards consideration and does not involve an unreviewed safety question as defined in 10 CFR50.59.

ENVIRONMENTAL IMPACT

Detroit Edison has reviewed the proposed Technical Specification changes against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor significantly change the types or significantly increase the amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, Detroit Edison concludes that the proposed Technical Specifications meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

CONCLUSION

Based on the evaluations above: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the proposed amendment will not be inimical to the common defense and security or the health and safety of the public.

Detroit Edison requests that the proposed license amendment be effective immediately upon approval by the Commission.

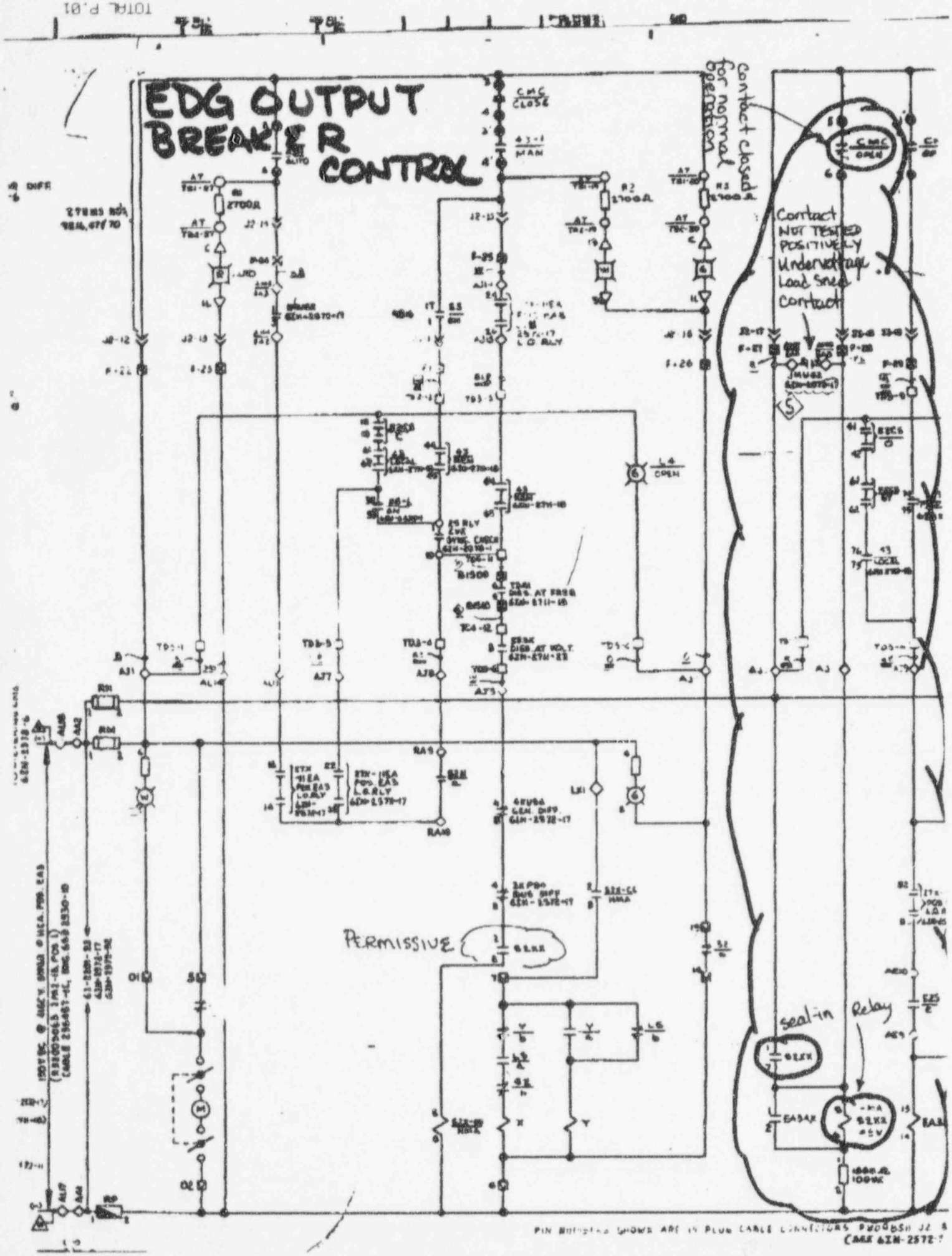
TABLE NO. 1
480-Volt Emergency Load Sequencer List

LOAD DESCRIPTION (Grouped by connected Diesel Generator)	480V MCC	LOAD RATING (HP)
Drywell Cooling Fan #1	72B-3A	30.0
RCIC & CSS Room Cooler	72B-3A	15.0
Div. I Control Air Compressor Room Cooler	72B-3A	5.0
Div. I Switchgear Room East ESS Cooler	72B-2B	5.0
Div. I Switchgear Room West ESS Cooler	72B-2B	5.0
Div. I Control Air Compressor	72B-3A	30.0
Div. I Battery Charger Room Cooler	72B-2A	5.0
Drywell Cooling Fan #2	72C-3A	30.0
Div. I Thermal Recombiner Cooling Unit	72C-3A	5.0
Div. I RHR Room Cooler	72C-3A	20.0
Div. I EECW Room Cooler	72C-3A	5.0
Div. I SGTS Room Cooler	72C-2A	3.0
Div. I CCHVAC Recirc/Emergency Makeup Fan	72C-2A	20.0
Div. I CCHVAC Return Air Fan	72C-2A	25.0
Div. I CCHVAC Chill Water Pump	72C-2A	7.5
Div. I CCHVAC Supply Fan	72C-2A	40.0
Div. I A/C Equipment Room Cooling Unit	72C-2A	1.0
Div. I CCHVAC Chiller Compressor Oil Pump	72C-2A	0.25
Div. I CCHVAC Emergency Makeup Filter Heater	72C-2A	16.1
Cable Tray Cooling Fan	72C-2A	1.0
Drywell Cooling Fan #3	72E-5A	30.0
Div. II Control Air Compressor Room Cooler	72E-5A	5.0
Div. II Core Spray Room Cooler	72E-5A	15.0
HPCI Room Cooler	72E-5A	7.5
Div. II Control Air Compressor	72E-5A	30.0
Drywell Cooling Fan #4	72F-4A	30.0
Div. II Switchgear Room East ESS Cooler	72F-2A	5.0
Div. II Switchgear Room West ESS Cooler	72F-2A	5.0
Div. II EECW Room Cooler	72F-4A	5.0
Div. II Thermal Recombiner Room Cooler	72F-4A	5.0
Div. II RHR Room Cooler	72F-4A	20.0
Div. II SGTS Room Cooler	72F-5A	3.0
Div. II CCHVAC Recirc/Emergency Makeup Fan	72F-5A	20.0
Div. II Battery Charger Room Cooler	72F-2A	2.0
Div. II CCHVAC Chill Water Pump	72F-5A	7.5
Div. II A/C Equipment Room Cooling Unit	72F-5A	1.0
Div. II CCHVAC Supply Fan	72F-5A	40.0
Div. II CCHVAC Return Air Fan	72F-5A	25.0

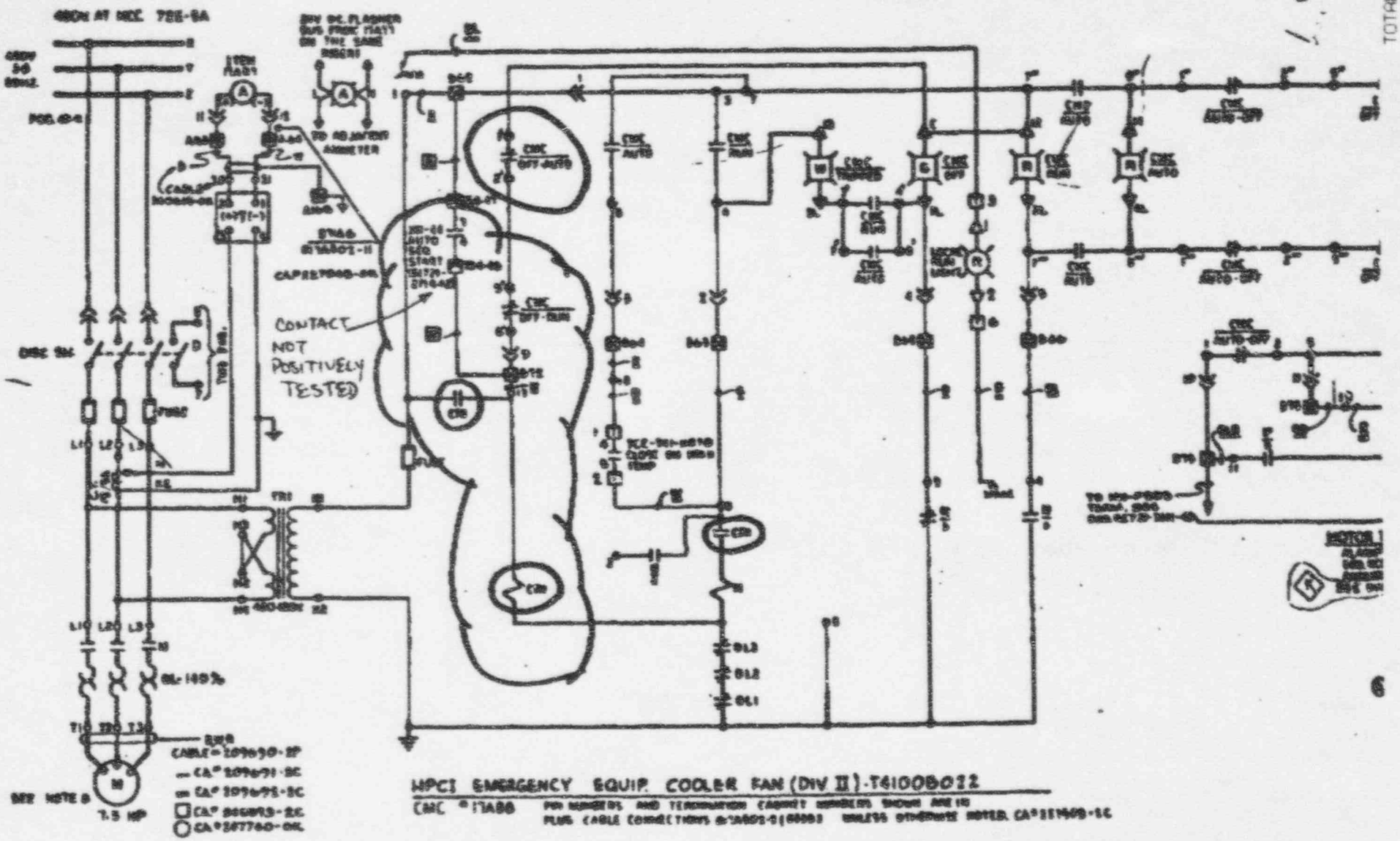
TABLE NO. 1
480-Volt Emergency Load Sequencer List (Cont'd)

LOAD DESCRIPTION (Grouped by connected Diesel Generator)	480V MCC	LOAD RATING (HP)
Div. II CCHVAC Chiller Comp Oil Pump	72F-5A	0.25
Div. II CCHVAC Em Makeup Filter Heater	72F-5A	16.1

NOTE: 480V MCC's prefixed 72B are associated with Diesel Generator No. 11
480V MCC's prefixed 72C are associated with Diesel Generator No. 12
480V MCC's prefixed 72E are associated with Diesel Generator No. 13
480V MCC's prefixed 72F are associated with Diesel Generator No. 14


EDG OUTPUT BREAKER CONTROL
Contact closed for normal operation
Contact NOT TESTED POSITIVELY Undervoltage Load Shed Contact
CMC CLOSE
PERMISSIVE
seal-in Relay
PIN NUMBERS SHOWN ARE IN PLUG CABLE CONNECTIONS PROVIDED

480V LOAD SEQUENCER (TYPICAL)



HPCI EMERGENCY EQUIP. COOLER FAN (DIV II)-T4100B022

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ATTACHMENT 2

PROPOSED
TECHNICAL SPECIFICATION
CHANGES