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Exelon SM
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10 CFR 50.90

June 26, 2001

Docket Nos. 50-352
50-353

License Nos. NPF-39
NPF-85

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Limerick Generating Station (LGS), Units 1 and 2
License Amendment Request No. 99-10-0

Dear Sir/Madam:

Exelon Generation Company, LLC (Exelon) is submitting License Amendment Request No. 99-10-0, in accordance with 10 CFR 50.90, requesting a change to Appendix A of Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively.

The proposed changes will revise LGS Technical Specifications (TS) to take advantage of the inherent overlap of the degraded voltage relays' characteristics such that inoperable relays that define a channel can be taken out of service without placing its associated source breaker in the trip position.

Attachment 1 to this letter describes the proposed changes and provides justification for the changes, including the basis for Exelon's determination that the proposed changes do not involve a significant hazards consideration. Attachments 2 and 3 to this letter provide the "marked-up" and "camera-ready" TS pages, respectively. This information is being submitted under affirmation, and the required affidavit is enclosed.

A001

A copy of this License Amendment Request, including the reasoned analysis about a no significant hazards consideration, is being provided to the appropriate Pennsylvania State official in accordance with the requirements of 10 CFR 50.91(b)(1).

We request that, if approved, the changes be issued by December 21, 2001, and become effective within 30 days of issuance.

If you have any questions, please do not hesitate to contact us.

Sincerely,

James A. Hutton
Director - Licensing
Mid-Atlantic Regional Operating Group

Attachments

cc: H. J. Miller, Administrator, Region I, USNRC (w/ Attachments)
A. L. Burritt, USNRC Senior Resident Inspector, LGS "
R. R. Janati, PA Bureau of Radiological Protection "

COMMONWEALTH OF PENNSYLVANIA :

: **ss**

COUNTY OF CHESTER :

J. J. Hagan, being first duly sworn, deposes and says:

That he is Senior Vice President of Exelon Generation Company, LLC, the Applicant herein; that he has read the attached License Amendment Request No. 99-10-0 involving clarification of offsite power requirements for Limerick Generating Station, Units 1 and 2, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

Senior Vice President

Subscribed and sworn to
before me this 26th day
of June 2001.

Notary Public

Notarial Seal
Vivia V. Gallimore, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires Oct. 6, 2003
Member, Pennsylvania Association of Notaries

ATTACHMENT 1

LIMERICK GENERATING STATION UNITS 1 & 2

DOCKET NOS.50-352
50-353

LICENSE NOS.NPF-39
NPF-85

LICENSE AMENDMENT REQUEST

NO. 99-10-0

"CLARIFICATION OF OFFSITE POWER REQUIREMENTS"

Supporting Information for Change - 9 Pages

Introduction

Exelon Generation Company, LLC (Exelon), Licensee under Facility Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, requests that the Technical Specifications (TS) contained in Appendix A to the Operating Licenses be amended to revise TS Section 3/4.3.3 and its associated TS Bases. The change to Action 36 clarifies equipment affected by inoperable components. The change to Action 37 takes advantage of the inherent overlap of the degraded voltage relays' characteristics such that inoperable relays that define a channel can be taken out of service without placing its associated source breaker in the trip position. The proposed changes to the LGS Units 1 and 2 TS are indicated by markups on TS page 3/4 3-36 and TS Bases page B 3/4 3-3 (Attachment 2). This License Change Application provides a discussion and description of the proposed TS changes, a safety assessment of the proposed TS changes, information supporting a finding of No Significant Hazards Consideration and information supporting an Environmental Assessment.

Discussion and Description of the Proposed Changes

LGS TS Actions 36 and 37 under Table 3.3.3-1 are associated with the Loss of Power relays that monitor the voltage on the Emergency Buses and Offsite Power supplies to the Emergency Buses. Action 36 is associated with the "Loss of Voltage" undervoltage relays that monitor Emergency Bus voltage; Action 37 is associated with the "Degraded Voltage" undervoltage relays that monitor the Offsite Power systems. Each 4kV Emergency Bus (4 per unit) is monitored by its own Loss of Voltage (Action 36) undervoltage relay. This bus undervoltage relay provides three functions under the (LGS) specific design. If power is lost to the bus, the relay de-energizes to shed loads from the bus, and to initiate logic to transfer the bus to the alternate offsite source or to the Emergency Diesel Generator (EDG) if the alternate offsite source is not available. The proposed change to Action 36 declares the alternate offsite source inoperable in addition to the EDG. Each 4kV Emergency Bus can be supplied from either of two offsite sources. Each offsite source breaker to each Emergency Bus has a Degraded Voltage scheme (Action 37) that consists of three monitoring relays. The three relays make up a scheme to detect different degrees of voltage degradation (the scheme is described in the subsequent Safety Assessment, and in Section 8.1.6.3.6 of the LGS Updated Final Safety Analysis Report (UFSAR)). Operation (voltage dropping below the relay setpoint for a minimum time) of any of these three relays results in the tripping of its associated breaker. Tripping of the breaker causes the bus to be de-energized and the Loss of Voltage relay on that bus would then de-energize to shed loads and enable the transfer to the alternate offsite source or EDG. The proposed change to Action 37 allows one of the three relays that comprise a scheme to be taken out of service (placed in the bypassed condition) as long as the other two relays in that scheme are operable.

LGS TS Actions 36 and 37 are taken verbatim from the Standard Technical Specifications (NUREG 0123, Rev. 3). (NOTE: LGS TS Actions 36 and 37 correspond to Standard Technical Specifications Actions 35 and 36, respectively.) LGS Action 36 has the associated Emergency Diesel Generator (EDG) declared inoperable when the corresponding Loss of Voltage channel (relay) is inoperable. Although LGS Action 36 is correct as applied to the LGS specific design, it does not go far enough in describing the impact associated with the inoperable Emergency Bus undervoltage relay. As presented above, this relay also affects the logic to transfer the Emergency Bus to the alternate offsite source. LGS Action 36 is changed to include the

alternate offsite source design feature such that the appropriate equipment considerations are made.

Standard Technical Specification Action 36 (which corresponds to LGS Action 37, and subsequently referred to as Action 37) is based upon the standard design for degraded voltage monitoring schemes provided in the NRC Power Systems Branch (PSB) Branch Technical Position (BTP) #1, found in Appendix 8A to Standard Review Plan (NUREG 0800). The standard design utilizes coincident logic to separate the Emergency Bus from the offsite power system if a sustained degraded voltage condition exists. Action 37 requires that an inoperable channel be placed in the tripped condition, thereby making up half of the coincident logic. The LGS specific design does not utilize coincident logic; placing an inoperable channel in the tripped condition trips that offsite source breaker to that Emergency Bus, limiting one source of viable power to that bus. Details of the LGS specific design and comparison to BTP – PSB 1, along with justification for not providing coincident logic, are provided in Section 8.1.6.3.6 of the LGS UFSAR.

Action 37 is changed to take advantage of the inherent overlap of the degraded voltage relays' characteristics such that inoperable relays that define the channel can be taken out of service without placing its associated source breaker in the trip position. The proposed change to Action 37 provides operational flexibility and increases the availability of offsite power to a 4 kV Emergency Bus. For two of the three relays in each channel, the proposed change takes credit for the inherent overlap of characteristics of the relays that comprise a channel to permit a relay to be placed in the bypass condition if the other relays in the channel are operable. For the third relay in each channel, the proposal takes credit for the corresponding relays in other channels monitoring the same parameter, along with increased surveillance of the offsite power system. The TS change proposal demonstrates that the loss of any one relay in a channel will not result in the loss of degraded voltage detection capability. This change will permit the offsite source to continue to supply power to the associated emergency bus; it will not require the offsite source to be disconnected due to an inoperable monitoring relay.

Safety Assessment

Action 36
The proposed change to Action 36 details what equipment is impacted by an inoperable bus undervoltage relay. Making these changes assures that the appropriate equipment is considered inoperable. The current TS describe the actions required when this equipment is removed from service. Changing Action 36 does not adversely impact the availability or reliability of the onsite or offsite power systems. Compliance with existing TS assures that the proper considerations are made when the equipment is taken out of service, and that the equipment is returned to service within the allowable out of service times.

Action 37
The current LGS TS Table 3.3.3-1 and the associated Actions are modeled after the Standard Technical Specifications, which are based upon a standard design provided in BTP PSB-1, "Adequacy of Station Electric Distribution System Voltages" (NUREG 0800). LGS UFSAR Section 8.1.6.3.6 describes the design of the degraded voltage detection relays and identifies the differences in the LGS design versus the standard design. One key difference is that the standard design uses coincident logic to achieve redundancy whereas the LGS design achieves

its redundancy at the bus level; the plant has been analyzed to demonstrate that all necessary safety functions can be achieved following the loss of any one of the four Emergency Buses.

Action 37, which applies to the degraded voltage relays, currently states: "With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel in the tripped condition within 1 hour; operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST." With the standard (non-LGS) design, placing a channel in the tripped condition arms the logic such that if another channel detects the condition (loss of power, or degraded voltage) the resultant action (trip, and/or alarm) would take place. Placing a standard design channel in the tripped condition results in no equipment action. However, considering the LGS design, placing the channel (relay) in the tripped condition results in making the associated offsite source circuit breaker unavailable to that bus. Since there is no identified discrepant condition on the offsite source, removing it from service is not a desirable, or logical, action. Action 37 in the LGS TS is changed to place the relay or channel in the bypassed condition and to assure that other relays capable of providing similar detection are operable. If the other relays in that channel are concurrently not operable, the associated circuit breaker is declared inoperable and the actions of TS 3.8.1.1 or 3.8.1.2 regarding the operability of the offsite sources are invoked.

The following is a description of the LGS relay logic. Refer to Diagram 1 (Attached) for a graphical depiction of the description. Operation of any of these relays results in the tripping of the associated circuit breaker that supplies offsite power to that Emergency Bus. This scheme is repeated eight times in each unit (i.e., there are two offsite source breakers per Emergency Bus, and four Emergency Buses per unit).

The 127-11X0X (127) relay is an inverse time-voltage relay that starts timing below 2905 V (70%), and operates nominally in 1 second (0.92 seconds) at 0 V. This relay would be the first degraded voltage relay to sense the total loss of its source.

The 127Y-11X0X (127Y) is also an inverse time-voltage relay that starts timing below 3640 V (87.5%) with a total time-delay of 60 seconds or less. The purpose of this relay is to detect degraded voltages between the ranges of the first and third relays, and to provide an inverse time voltage characteristic that bridges the range between the 127 and 127Z relays.

The 127Z-11X0X (127Z) is a definite time-delay relay that operates below 3910 V (94%). This sensing relay drives the two auxiliary timing relays that are set to operate at 60 seconds (non-LOCA) and 9 seconds (LOCA). The purpose of the non-LOCA time-delay is to allow sufficient time for the automatic load tap changers on the safeguard transformers to adjust and counter the degraded voltage condition. The purpose of the LOCA time-delay is to limit the exposure of Class 1E equipment to the degraded voltage condition to 9 seconds after the undervoltage relay operates while preventing spurious trips of the offsite source breaker during voltage transients caused by motor starts.

The following discussion demonstrates how the inherent overlap of the degraded voltage relays' characteristics permits one relay to be taken out of service at a time without negatively impacting power to the emergency buses or the connected loads. The discussion addresses both LOCA and non-LOCA conditions for each relay in the scheme.

The 127 relay will detect a loss of its offsite source of power under both LOCA and non-LOCA conditions. The non-LOCA function of an inoperable 127 is accomplished by an operable 127Y

relay. Utilizing the 127Y relay results in a longer response time (21-30 seconds) for detecting a loss of that source of offsite power; however, this time is not significant under non-accident conditions. The LOCA function of an inoperable 127 is accomplished by an operable 127Z relay. Under loss of offsite power (LOOP) / LOCA conditions, the Emergency Diesel Generators (EDGs) receive a pre-emptive LOCA start signal which will start the EDGs prior to them receiving a start signal from the LOOP logic. The EDG starting (accelerating) time is still critical path in this scenario, and the increased 9 seconds in the LOOP detection (10 seconds for operation of the 127Z less the nominal 1 second operation of the 127 sequence) is still enveloped by the EDG starting time.

There is no LOCA function associated with the 127Y relay. The function of an inoperable 127Y is accomplished by an operable 127Z relay. Under LOCA conditions, the 127Z would always respond sooner than the 127Y for degraded voltage conditions. The setpoint of 127Z is higher than that of the 127Y, and the time delay of the 127Z LOCA timer is less than the minimum time delay of the 127Y relay. Under non-LOCA conditions, the 127Y relay bridges the range between the 127 and the 127Z. The 127Y provides tripping between the value of 87.5%, 60 seconds, and 70%, 31 seconds. If the bus voltage were to make a step change to this range, then the tripping action would not take place until the 127Z relay operated, 60 seconds. This would result in a maximum additional 29 second time delay if the voltage were to step change to 70% of nominal. There has been no historical precedent for the local grid or equipment to perform in this manner. There is no identified condition that could cause this effect. Nevertheless, operating at this voltage for less than 30 seconds would not cause any detrimental effects to the connected equipment.

Unlike the 127 and 127Y relays, there is no overlap of detection of a degraded voltage condition available for the 127Z relay under LOCA conditions. The function can be accomplished by periodically assuring that the corresponding offsite source voltage is above the minimum value assumed by the voltage regulation calculations. Technical Specification Bases 3/4.8 details acceptable grid voltage levels and equipment status (bus alignment configuration and Load Tap Changer operability) used to define operability of the offsite sources. These Bases identify grid voltage at 95% nominal as an acceptable value. If the offsite source voltage is maintained above this value, then the voltage regulation calculations demonstrate that the voltage profile throughout the LOCA loading sequence would be acceptable, and would not cause the 127Z relay to operate. The proposed change to the Technical Specifications requires that grid voltage be monitored to 100% nominal. This provides an additional 5% margin to the value assumed in the voltage regulation calculations. Note: As described in LGS TS Bases 3/4.8, the operability of an offsite source is defined by configuration, grid voltage level, and availability of the Load Tap Changers. Subsequent discussions regarding monitoring of grid voltage include consideration of the grid and source configuration, and availability of the Load Tap Changer.

Information Supporting a Finding of No Significant Hazards Consideration

We have concluded that the changes to the Limerick Generating Station (LGS) Units 1 and 2 Technical Specifications (TS), which will revise TS Section 3/4.3.3, "Emergency Core Cooling System Actuation Instrumentation," and its associated TS Bases, do not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three (3) standards set forth in 10CFR50.92 is provided below.

The changes are associated with the onsite and offsite electrical power systems. The onsite and offsite sources' design basis is derived from General Design Criterion 17, from Appendix A of 10 CFR 50. GDC-17 states: "An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents." Discussions regarding any potential increase in the probability of previously evaluated accidents are therefore centered on any change in probability of the loss of offsite power. A loss of offsite power is an identified transient. Discussions regarding any potential increase in the consequences of previously evaluated accidents are centered on any change in the availability and quality of power from both the onsite and offsite power systems.

Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Action 36
The change to Action 36 details what equipment is impacted by an inoperable bus undervoltage relay. Making these changes assures that the appropriate equipment is considered inoperable. The current TS describe the actions required when this equipment is removed from service. Changing Action 36 does not adversely impact the availability or reliability of the onsite or offsite power systems. Compliance with existing TS assures that the proper considerations are made when the equipment is taken out of service, and that the equipment is returned to service within the allowable out of service times. Identifying the impacted equipment for an inoperable undervoltage relay does not increase the probability of occurrence or the consequences of an accident previously evaluated.

Action 37
The changes to Action 37 delineate actions on individual relays that make up a channel of the degraded voltage relays. Changing Action 37 to place relays in the bypass condition permits the offsite source of power to still be available to the bus. The change will not increase the probability of an accident since maintaining two offsite sources will not induce an accident or transient. Inoperability of a relay that monitors offsite source voltage does not make the offsite source inoperable, and disabling the offsite source breaker due to the loss of the monitoring instrument is not more conservative. The loss of offsite power transient is initiated by events occurring on the offsite sources, and not centered in plant equipment. Changing Action 37 does not adversely impact the availability or reliability of the offsite power system; the availability of the source of offsite power is increased as a result of this change since it is not disconnected from the bus due to the inoperability of an instrument. Further, placing a source breaker in the tripped condition (per the existing TS) requires the 4 kV bus to be manually transferred to the other offsite source; this action could introduce a plant transient. Therefore, the proposed changes to Action 37 do not increase the probability of occurrence of an accident previously evaluated.

The changes to Action 37 take credit for overlapping relay coverage and verification of the acceptability of the offsite source voltage in the event of an inoperable relay. The proposed actions are sufficient to assure that adequate voltage is supplied to the Class 1E equipment for all situations (both LOCA and non-LOCA). Inability to accomplish the proposed actions results

in placing the instrument channel into the tripped condition, which are the current requirements under Action 37. Under these circumstances fulfillment of this action would be appropriate since the monitoring scheme would not provide acceptable monitoring. As the analysis has been performed to demonstrate that these actions provide an acceptable level of voltage monitoring for the Class 1E equipment, the changes to Action 37 do not increase the consequences of an accident previously evaluated.

Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Action 36
The change to Action 36 details what equipment is impacted by an inoperable bus undervoltage relay. Making these changes assures that the appropriate equipment is considered inoperable. The current TS describe the actions required when this equipment is removed from service. Changing Action 36 does not adversely impact the availability or reliability of the onsite or offsite power systems. Compliance with existing TS assures that the proper considerations are made when the equipment is taken out of service, and that the equipment is returned to service within the allowable out of service times. Identifying the impacted equipment for an inoperable undervoltage relay does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Action 37
The proposed changes to Action 37 provide the necessary actions for inoperable monitoring relays within a channel. These actions assure that the monitoring system provides an acceptable level of detection. The identified difference that could impact connected loads involves an inoperable 127Y relay in that there is the highly unlikely condition of exposing the connected loads to a voltage between 70-85% for an additional 15-30 seconds under non-LOCA conditions. Operating equipment under these conditions may either result in increased running current on the equipment, operation due to components de-energizing (some relays dropping out causing logic to actuate), or no noticeable effects. Motor long-time overcurrent devices are set in the range of 130-150%, with an operating time of 90-120 seconds. This setting assures that the motor will be protected against damage from overcurrent. The total time that a motor would be exposed to this degraded voltage would be 60 seconds, which is not enough time to operate the motor overcurrent device. As the motor is not damaged, and does not trip, there is no impact associated with operating a motor under these conditions.

The operation of some equipment as a result of relays dropping out is not significant in that the normal action from a loss or degradation of an offsite source is for this equipment to be ultimately de-energized. As these are the only potentially impacting changes associated with this amendment request, and these changes have been demonstrated to not introduce new failure modes, the changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Does the proposed amendment involve a significant reduction in a margin of safety?

Action 36
The change to Action 36 provides details regarding what equipment is impacted by removing the bus loss of voltage relay from operation. Making these changes assures that the appropriate equipment is considered inoperable. The TS already describe the actions required when this equipment is removed from service; the change is bounded by the existing margin of safety.

Action 37
The Loss of Power instrumentation is included with the Emergency Core Cooling System (ECCS) actuation instrumentation in Table 3.3.3-1 of the TS. The Bases provided for Table 3.3.3-1 instruments states: "The emergency core cooling system actuation instrumentation is provided to initiate actions to mitigate the consequences of accidents that are beyond the ability of the operator to control." Based upon discussions in Section 8 of the UFSAR, and review of GE BWR Standard Technical Specifications, the following is added to the TS Bases for Table 3.3.3-1 in regard to the loss of power instrumentation: "Successful operation of the required safety functions of the Emergency Core Cooling Systems (ECCS) is dependent upon the availability of adequate power for energizing various components such as pump motors, motor operated valves, and the associated control components. If the loss of power instrumentation detects that voltage levels are too low, the buses are disconnected from the offsite power sources and connected to the onsite diesel generator (DG) power sources. The loss of power relays in each channel have sufficient overlapping detection characteristics and functionality to permit operation subject to the conditions in Action Statement 37."

The engineering analysis performed in support of the proposed change to Action 37 demonstrated that performing the actions under Action 37 provides an acceptable level of degraded voltage monitoring. Operating under the direction of Action 37 assures that the 4 kV electrical distribution system will respond to all accidents and transients within the previously identified time constraints, and therefore, there is no change in transient or accident core thermal hydraulic conditions or peak reactor coolant pressure which would violate the fuel design limits or reactor coolant system design pressure. There are instances (non-LOCA) where the sensing time associated with a loss of offsite power or degraded voltage condition would be extended (21-30 seconds and 15-29 seconds, respectively); however, this time is not critical since there is no accident or other transient proposed coincident with this condition. The time delay added to the loss of offsite power or degraded voltage detection under LOCA conditions is not critical path time (it is in parallel with the EDG starting time) and is bounded by existing analyzed conditions.

The proposed change will not reduce the margin of safety since sufficient detection will be maintained by the remaining relays and the operator action of monitoring grid voltage.

Therefore, the proposed TS changes do not involve a significant reduction in the margin of safety.

Information Supporting an Environmental Assessment

An Environmental Assessment is not required for the changes proposed by this License Amendment Request because the requested changes to the LGS, Units 1 and 2, TS conform to the criteria for "actions eligible for categorical exclusion" as specified in 10 CFR 51.22 (c)(9). The requested changes will have no impact on the environment. The proposed changes do not involve a significant hazards consideration as discussed in the preceding section. The proposed changes do not involve a significant change in the types, or a significant increase in the amounts, of any effluents that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

Conclusion

The Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed and concurred with these proposed changes to the Limerick Generating Station, Units 1 and 2, Technical Specifications.

ATTACHMENT 2

LCR 99-10-0

LIMERICK GENERATING STATION, UNITS 1 & 2

TECHNICAL SPECIFICATIONS

"MARKED-UP PAGES"

LIST OF AFFECTED PAGES

Units 1 and 2

3/4 3-36
B3/4 3-3
Inserts 'A' and 'B'

TABLE 3.3.3-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
ACTION STATEMENTS

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. With one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the associated system inoperable.

b. With more than one channel inoperable, declare the associated system inoperable.

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, declare the associated ECCS inoperable within 24 hours.

ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 24 hours.

ACTION 33 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 24 hours or declare the associated ECCS inoperable.

ACTION 34 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. For one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

b. With more than one channel inoperable, declare the HPCI system inoperable.

ACTION 35 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

See Insert (A)

ACTION 36 - With the number of OPERABLE channels less than the Total Number of Channels, declare the associated emergency diesel generator inoperable and take the ACTION required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel in the tripped condition within 1 hour; operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST.

See Insert (A)

3/4.3.3 EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION (Continued)

Specified surveillance intervals and maintenance outage times have been determined in accordance with NEDC-30936P, Parts 1 and 2, "Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation)," as approved by the NRC and documented in the SER (letter to D. N. Grace from A. C. Thadani dated December 9, 1988 (Part 1) and letter to D. N. Grace from C. E. Rossi dated December 9, 1988 (Part 2)). See Insert (B)

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is an allowance for instrument drift specifically allocated for each trip in the safety analyses.

3/4.3.4 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The anticipated transient without scram (ATWS) recirculation pump trip system provides a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within the envelope of study events in General Electric Company Topical Report NEDO-10349, dated March 1971, NEDO-24222, dated December 1979, and Section 15.8 of the FSAR.

The end-of-cycle recirculation pump trip (EOC-RPT) system is a supplement to the reactor trip. During turbine trip and generator load rejection events, the EOC-RPT will reduce the likelihood of reactor vessel level decreasing to level 2. Each EOC-RPT system trips both recirculation pumps, reducing coolant flow in order to reduce the void collapse in the core during two of the most limiting pressurization events. The two events for which the EOC-RPT protective feature will function are closure of the turbine stop valves and fast closure of the turbine control valves.

A fast closure sensor from each of two turbine control valves provides input to the EOC-RPT system; a fast closure sensor from each of the other two turbine control valves provides input to the second EOC-RPT system. Similarly, a position switch for each of two turbine stop valves provides input to one EOC-RPT system; a position switch from each of the other two stop valves provides input to the other EOC-RPT system. For each EOC-RPT system, the sensor relay contacts are arranged to form a 2-out-of-2 logic for the fast closure of turbine control valves and a 2-out-of-2 logic for the turbine stop valves. The operation of either logic will actuate the EOC-RPT system and trip both recirculation pumps.

Each EOC-RPT system may be manually bypassed by use of a keyswitch which is administratively controlled. The manual bypasses and the automatic Operating Bypass at less than 30% of RATED THERMAL POWER are annunciated in the control room.

The EOC-RPT system response time is the time assumed in the analysis between initiation of valve motion and complete suppression of the electric arc, i.e., 175 ms. Included in this time are: the response time of the sensor, the time allotted for breaker arc suppression, and the response time of the system logic.

TABLE 3.3.3-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
ACTION STATEMENTS

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. With one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the associated system inoperable.

b. With more than one channel inoperable, declare the associated system inoperable.

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, declare the associated ECCS inoperable within 24 hours.

ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 24 hours.

ACTION 33 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 24 hours or declare the associated ECCS inoperable.

ACTION 34 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. For one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

b. With more than one channel inoperable, declare the HPCI system inoperable.

ACTION 35 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable. See Insert (A)

ACTION 36 - With the number of OPERABLE channels less than the Total Number of Channels, declare the associated emergency diesel generator inoperable and take the ACTION required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel in the tripped condition within 1 hour; operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST.

See Insert (A)

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION (Continued)

Specified surveillance intervals and maintenance outage times have been determined in accordance with NEDC-30936P, Parts 1 and 2, "Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation)," as approved by the NRC and documented in the SER (letter to D. N. Grace from A. C. Thadani dated December 9, 1988 (Part 1) and letter to D. N. Grace from C. E. Rossi dated December 9, 1988 (Part 2)). ← see Insert (B)

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is an allowance for instrument drift specifically allocated for each trip in the safety analyses.

3/4.3.4 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The anticipated transient without scram (ATWS) recirculation pump trip system provides a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within the envelope of study events in General Electric Company Topical Report NEDO-10349, dated March 1971, NEDO-24222, dated December 1979, and Section 15.8 of the FSAR.

The end-of-cycle recirculation pump trip (EOC-RPT) system is a supplement to the reactor trip. During turbine trip and generator load rejection events, the EOC-RPT will reduce the likelihood of reactor vessel level decreasing to level 2. Each EOC-RPT system trips both recirculation pumps, reducing coolant flow in order to reduce the void collapse in the core during two of the most limiting pressurization events. The two events for which the EOC-RPT protective feature will function are closure of the turbine stop valves and fast closure of the turbine control valves.

A fast closure sensor from each of two turbine control valves provides input to the EOC-RPT system; a fast closure sensor from each of the other two turbine control valves provides input to the second EOC-RPT system. Similarly, a position switch for each of two turbine stop valves provides input to one EOC-RPT system; a position switch from each of the other two stop valves provides input to the other EOC-RPT system. For each EOC-RPT system, the sensor relay contacts are arranged to form a 2-out-of-2 logic for the fast closure of turbine control valves and a 2-out-of-2 logic for the turbine stop valves. The operation of either logic will actuate the EOC-RPT system and trip both recirculation pumps.

Each EOC-RPT system may be manually bypassed by use of a keyswitch which is administratively controlled. The manual bypasses and the automatic Operating Bypass at less than 30% of RATED THERMAL POWER are annunciated in the control room.

The EOC-RPT system response time is the time assumed in the analysis between initiation of valve motion and complete suppression of the electric arc, i.e., 175 ms. Included in this time are: the response time of the sensor, the time allotted for breaker arc suppression, and the response time of the system logic.

ATTACHMENT 3

LCR 99-10-0

LIMERICK GENERATING STATION, UNITS 1 & 2

TECHNICAL SPECIFICATIONS

"CAMERA-READY PAGES"

LIST OF AFFECTED PAGES

Units 1 and 2

3/4 3-36
3/4 3-36a
B3/4 3-3
B3/4 3-3a

TABLE 3.3.3-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
ACTION STATEMENTS

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. With one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the associated system inoperable.

b. With more than one channel inoperable, declare the associated system inoperable.

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, declare the associated ECCS inoperable within 24 hours.

ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 24 hours.

ACTION 33 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 24 hours or declare the associated ECCS inoperable.

ACTION 34 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. For one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

b. With more than one channel inoperable, declare the HPCI system inoperable.

ACTION 35 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

ACTION 36 - With the number of OPERABLE channels less than the Total Number of Channels, declare the associated emergency diesel generator and the associated offsite source breaker that is not supplying the bus inoperable and take the ACTION required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

TABLE 3.3.3-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
ACTION STATEMENTS

ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable device in the bypassed condition subject to the following conditions:

Inoperable Device	Condition
127-11X0X	127Y-11X0X and 127Z-11X0X operable
127Y-11X0X	127-11X0X and 127Z-11X0X operable
127Z-11X0X	127-11X0X and 127Y-11X0X operable. 127Z-11Y0Y operable for the other 3 breakers monitoring that source, offsite source grid voltage for that source is maintained at or above 230kV (for the 101 Safeguard Bus Source) or 525kV (for the 201 Safeguard Bus Source), Load Tap Changer for that source is in service and in automatic operation, and the electrical buses and breaker alignments are maintained within bounds of approved plant procedures.

or, place the inoperable channel in the tripped condition within 1 hour and take the Action required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

Operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST.

3/4.3.3 EMERGENCY CORE COOLING ACTUATION INSTRUMENTATION (Continued)

Specified surveillance intervals and maintenance outage times have been determined in accordance with NEDC-30936P, Parts 1 and 2, "Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation)," as approved by the NRC and documented in the SER (letter to D. N. Grace from A. C. Thadani dated December 9, 1988 (Part 1) and letter to D. N. Grace from C. E. Rossi dated December 9, 1988 (Part 2)).

Successful operation of the required safety functions of the Emergency Core Cooling Systems (ECCS) is dependent upon the availability of adequate power for energizing various components such as pump motors, motor operated valves, and the associated control components. If the loss of power instrumentation detects that voltage levels are too low, the buses are disconnected from the offsite power sources and connected to the onsite diesel generator (DG) power sources. The loss of power relays in each channel have sufficient overlapping detection characteristics and functionality to permit operation subject to the conditions in Action Statement 37. Bases 3/4.8.1, 3/4.8.2, and 3/4.8.3 provide discussion regarding parametric bounds for determining operability of the offsite sources. Those Bases assume that the loss of power relays are operable. With an inoperable 127Z-11X0X relay, the grid voltage is monitored to 230kV (for the 101 Safeguard Bus Source) or 525kV (for the 201 Safeguard Bus Source) to increase the margin for the operation of the 127Z-11X0X relay.

Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is an allowance for instrument drift specifically allocated for each trip in the safety analyses.

3/4.3.4 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

The anticipated transient without scram (ATWS) recirculation pump trip system provides a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event falls within the envelope of study events in General Electric Company Topical Report NEDO-10349, dated March 1971, NEDO-24222, dated December 1979, and Section 15.8 of the FSAR.

The end-of-cycle recirculation pump trip (EOC-RPT) system is a supplement to the reactor trip. During turbine trip and generator load rejection events, the EOC-RPT will reduce the likelihood of reactor vessel level decreasing to level 2. Each EOC-RPT system trips both recirculation pumps, reducing coolant flow in order to reduce the void collapse in the core during two of the most limiting pressurization events. The two events for which the EOC-RPT protective feature will function are closure of the turbine stop valves and fast closure of the turbine control valves.

A fast closure sensor from each of two turbine control valves provides input to the EOC-RPT system; a fast closure sensor from each of the other two turbine control valves provides input to the second EOC-RPT system. Similarly, a position switch for each of two turbine stop valves provides input to one EOC-RPT system; a position switch from each of the other two stop valves provides input to the other EOC-RPT system. For each EOC-RPT system, the sensor relay contacts are arranged to form a 2-out-of-2 logic for the fast closure of turbine control valves and a 2-out-of-2 logic for the turbine stop valves. The operation of either logic will actuate the EOC-RPT system and trip both recirculation pumps.

3/4.3.4 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION (Continued)

Each EOC-RPT system may be manually bypassed by use of a keyswitch which is administratively controlled. The manual bypasses and the automatic Operating Bypass at less than 30% of RATED THERMAL POWER are annunciated in the control room.

The EOC-RPT system response time is the time assumed in the analysis between initiation of valve motion and complete suppression of the electric arc, i.e., 175 ms. Included in this time are: the response time of the sensor, the time allotted for breaker arc suppression, and the response time of the system logic.

TABLE 3.3.3-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
ACTION STATEMENTS

ACTION 30 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. With one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the associated system inoperable.

b. With more than one channel inoperable, declare the associated system inoperable.

ACTION 31 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, declare the associated ECCS inoperable within 24 hours.

ACTION 32 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place the inoperable channel in the tripped condition within 24 hours.

ACTION 33 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, restore the inoperable channel to OPERABLE status within 24 hours or declare the associated ECCS inoperable.

ACTION 34 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement:

a. For one channel inoperable, place the inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

b. With more than one channel inoperable, declare the HPCI system inoperable.

ACTION 35 - With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip Function requirement, place at least one inoperable channel in the tripped condition within 24 hours or declare the HPCI system inoperable.

ACTION 36 - With the number of OPERABLE channels less than the Total Number of Channels, declare the associated emergency diesel generator and the associated offsite source breaker that is not supplying the bus inoperable and take the ACTION required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

TABLE 3.3.3-1 (Continued)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
ACTION STATEMENTS

ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable device in the bypassed condition subject to the following conditions:

Inoperable Device	Condition
127-11X0X	127Y-11X0X and 127Z-11X0X operable
127Y-11X0X	127-11X0X and 127Z-11X0X operable
127Z-11X0X	127-11X0X and 127Y-11X0X operable. 127Z-11Y0Y operable for the other 3 breakers monitoring that source, offsite source grid voltage for that source is maintained at or above 230kV (for the 101 Safeguard Bus Source) or 525kV (for the 201 Safeguard Bus Source), Load Tap Changer for that source is in service and in automatic operation, and the electrical buses and breaker alignments are maintained within bounds of approved plant procedures.

or, place the inoperable channel in the tripped condition within 1 hour and take the Action required by Specification 3.8.1.1 or 3.8.1.2, as appropriate.

Operation may then continue until performance of the next required CHANNEL FUNCTIONAL TEST.

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION (Continued)

Specified surveillance intervals and maintenance outage times have been determined in accordance with NEDC-30936P, Parts 1 and 2, "Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation)," as approved by the NRC and documented in the SER (letter to D. N. Grace from A. C. Thadani dated December 9, 1988 (Part 1) and letter to D. N. Grace from C. E. Rossi dated December 9, 1988 (Part 2)).

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3/4.3.4 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION (Continued)

Each EOC-RPT system may be manually bypassed by use of a keyswitch which is administratively controlled. The manual bypasses and the automatic Operating Bypass at less than 30% of RATED THERMAL POWER are annunciated in the control room.

The EOC-RPT system response time is the time assumed in the analysis between initiation of valve motion and complete suppression of the electric arc, i.e., 175 ms. Included in this time are: the response time of the sensor, the time allotted for breaker arc suppression, and the response time of the system logic.