December 14, 1998

Mr. Garrett D. Edwards
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M96392 AND M96393)

Dear Mr. Edwards:

The Commission has issued the enclosed Amendment No. 132 to Facility Operating License No. NPF-39 and Amendment No. 93 to Facility Operating License No. NPF-85 for the Limerick Generating Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated August 8, 1996, as supplemented June 30, 1997 and August 26, 1998.

These amendments eliminate the response time testing requirements for selected sensors and specified instrument loops for 1) the reactor protection system, 2) the isolation system, and 3) the emergency core cooling system.

This completes our efforts on this issue and we are, therefore, closing out TAC Nos. M96392 and M96393.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,
original signed by:
Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

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PDR ADOCK 05000352
P PDR

Docket Nos. 50-352/353

Enclosures: 1. Amendment No.132 to License No. NPF-39
2. Amendment No.93 to License No. NPF-85
3. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 14, 1998

Mr. Garrett D. Edwards
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M96392 AND M96393)

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The Commission has issued the enclosed Amendment No. 132 to Facility Operating License No. NPF-39 and Amendment No. 93 to Facility Operating License No. NPF-85 for the Limerick Generating Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated August 8, 1996, as supplemented June 30, 1997 and August 26, 1998.

These amendments eliminate the response time testing requirements for selected sensors and specified instrument loops for 1) the reactor protection system, 2) the isolation system, and 3) the emergency core cooling system.

This completes our efforts on this issue and we are, therefore, closing out TAC Nos. M96392 and M96393.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Bartholomew C. Buckley

Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-352/353

Enclosures: 1. Amendment No. 132 to License No. NPF-39
2. Amendment No. 93 to License No. NPF-85
3. Safety Evaluation

cc w/encls: See next page

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PECO ENERGY COMPANY

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 132
License No. NPF-39

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by PECO Energy Company (the licensee) dated August 8, 1996, as supplemented June 30, 1997 and August 26, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-39 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 132 , are hereby incorporated into this license. PECO Energy Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

Robert A. Capra, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the
Technical Specifications

Date of Issuance: December 14, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 132

FACILITY OPERATING LICENSE NO. NPF-39

DOCKET NO. 50-352

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
3/4 3-6	3/4 3-6
3/4 3-23	3/4 3-23
3/4 3-24	3/4 3-24
3/4 3-25	3/4 3-25
3/4 3-26	3/4 3-26
3/4 3-39	3/4 3-39
B 3/4 3-1	B 3/4 3-1
B 3/4 3-2	B 3/4 3-2

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME (Seconds)
1. Intermediate Range Monitors:	
a. Neutron Flux - High	N.A.
b. Inoperative	N.A.
2. Average Power Range Monitor*:	
a. Neutron Flux - Upscale, Setdown	N.A.
b. Neutron Flux - Upscale	
1) Flow Biased	≤0.09
2) High Flow Clamped	≤0.09
c. Inoperative	N.A.
d. Downscale	N.A.
3. Reactor Vessel Steam Dome Pressure - High	≤0.55
4. Reactor Vessel Water Level - Low, Level 3	≤1.05#
5. Main Steam Line Isolation Valve - Closure	≤0.06
6. DELETED	DELETED
7. Drywell Pressure - High	N.A.
8. Scram Discharge Volume Water Level - High	
a. Level Transmitter	N.A.
b. Float Switch	N.A.
9. Turbine Stop Valve - Closure	≤0.06
10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≤0.08**
11. Reactor Mode Switch Shutdown Position	N.A.
12. Manual Scram	N.A.

* Neutron detectors are exempt from response time testing. Response time shall be measured from the detector output or from the input of the first electronic component in the channel.

** Measured from start of turbine control valve fast closure.

\# Sensor is eliminated from response time testing for the RPS circuits. Response time testing and conformance to the administrative limits for the remaining channel including trip unit and relay logic are required.

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
1. MAIN STEAM LINE ISOLATION	
a. Reactor Vessel Water Level	
1) Low, Low - Level 2	N.A.
2) Low, Low, Low - Level 1	≤1.0###*
b. DELETED	DELETED
c. Main Steam Line Pressure - Low	≤1.0###*
d. Main Steam Line Flow - High	≤0.5###*
e. Condenser Vacuum - Low	N.A.
f. Outboard MSIV Room Temperature - High	N.A.
g. Turbine Enclosure - Main Steam Line Tunnel Temperature - High	N.A.
h. Manual Initiation	N.A.
2. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION	
a. Reactor Vessel Water Level Low - Level 3	N.A.
b. Reactor Vessel (RHR Cut-In Permissive) Pressure - High	N.A.
c. Manual Initiation	N.A.
3. REACTOR WATER CLEANUP SYSTEM ISOLATION	
a. RWCS Δ Flow - High	N.A.##
b. RWCS Area Temperature - High	N.A.
c. RWCS Area Ventilation Δ Temperature - High	N.A.
d. SLCS Initiation	N.A.
e. Reactor Vessel Water Level - Low, Low - Level 2	N.A.
f. Manual Initiation	N.A.

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
4. HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION	
a. HPCI Steam Line Δ Pressure - High	N.A.
b. HPCI Steam Supply Pressure - Low	N.A.
c. HPCI Turbine Exhaust Diaphragm Pressure - High	N.A.
d. HPCI Equipment Room Temperature - High	N.A.
e. HPCI Equipment Room Δ Temperature - High	N.A.
f. HPCI Pipe Routing Area Temperature - High	N.A.
g. Manual Initiation	N.A.
5. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION	
a. RCIC Steam Line Δ Pressure - High	N.A.
b. RCIC Steam Supply Pressure - Low	N.A.
c. RCIC Turbine Exhaust Diaphragm Pressure - High	N.A.
d. RCIC Equipment Room Temperature - High	N.A.
e. RCIC Equipment Room Δ Temperature - High	N.A.
f. RCIC Pipe Routing Area Temperature - High	N.A.
g. Manual Initiation	N.A.

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
6. PRIMARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level	
1) Low, Low - Level 2	N.A.
2) Low, Low, Low - Level 1	N.A.
b. Drywell Pressure - High	N.A.
c. North Stack Effluent Radiation - High	N.A.
d. Deleted	
e. Reactor Enclosure Ventilation Exhaust Duct - Radiation - High	N.A.
f. Deleted	
g. Deleted	
h. Drywell Pressure - High/ Reactor Pressure - Low	N.A.
i. Primary Containment Instrument Gas to Drywell Δ Pressure - Low	N.A.
j. Manual Initiation	N.A.
7. SECONDARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level Low, Low - Level 2	N.A.
b. Drywell Pressure - High	N.A.
c.1. Refueling Area Unit 1 Ventilation Exhaust Duct Radiation - High	N.A.
2. Refueling Area Unit 2 Ventilation Exhaust Duct Radiation - High	N.A.
d. Reactor Enclosure Ventilation Exhaust Duct Radiation - High	N.A.
e. Deleted	

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
f. Deleted	
g. Reactor Enclosure Manual Initiation	N.A.
h. Refueling Area Manual Initiation	N.A.

TABLE NOTATIONS

(a) DELETED

(b) DELETED

* Isolation system instrumentation response time for MSIV only. No diesel generator delays assumed for MSIVs.

** DELETED

Isolation system instrumentation response time specified for the Trip Function actuating each valve group shall be added to isolation time shown in Tables 3.6.3-1, 3.6.5.2.1-1 and 3.6.5.2.2-1 for valves in each valve group to obtain ISOLATION SYSTEM RESPONSE TIME for each valve.

With 45 second time delay.

Sensor is eliminated from response time testing for the MSIV actuation logic circuits. Response time testing and conformance to the administrative limits for the remaining channel including trip unit and relay logic are required.

TABLE 3.3.3-3

EMERGENCY CORE COOLING SYSTEM RESPONSE TIMES

ECCS		RESPONSE TIME (Seconds)
1.	CORE SPRAY SYSTEM	≤ 27#
2.	LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM	≤ 40#
3.	AUTOMATIC DEPRESSURIZATION SYSTEM	N.A.
4.	HIGH PRESSURE COOLANT INJECTION SYSTEM	≤ 60#
5.	LOSS OF POWER	N.A.

ECCS actuation instrumentation is eliminated from response time testing.

3/4.3 INSTRUMENTATION

BASES

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

The reactor protection system automatically initiates a reactor scram to:

a. Preserve the integrity of the fuel cladding.

b. Preserve the integrity of the reactor coolant system.

c. Minimize the energy which must be adsorbed following a loss-of-coolant accident, and

d. Prevent inadvertent criticality.

This specification provides the limiting conditions for operation necessary to preserve the ability of the system to perform its intended function even during periods when instrument channels may be out of service because of maintenance. When necessary, one channel may be made inoperable for brief intervals to conduct required surveillance.

The reactor protection system is made up of two independent trip systems. There are usually four channels to monitor each parameter with two channels in each trip system. The outputs of the channels in a trip system are combined in a logic so that either channel will trip that trip system. The tripping of both trip systems will produce a reactor scram. The system meets the intent of IEEE-279 for nuclear power plant protection systems. Specified surveillance intervals and surveillance and maintenance outage times have been determined in accordance with NEDC-30851P, "Technical Specification Improvement Analyses for BWR Reactor Protection System," as approved by the NRC and documented in the NRC Safety Evaluation Report (SER) (letter to T.A. Pickens from A. Thadani dated July 15, 1987. The bases for the trip settings of RPS are discussed in the bases for Specification 2.2.1.

Automatic reactor trip upon receipt of a high-high radiation signal from the Main Steam Line Radiation Monitoring System was removed as the result of an analysis performed by General Electric in NEDO-31400A. The NRC approved the results of this analysis as documented in the SER (letter to George J. Beck, BWR Owner's Group from A.C. Thadani, NRC, dated May 15, 1991).

The measurement of response time at the specified frequencies provides assurance that the protective functions associated with each channel are completed within the time limit assumed in the safety analyses. No credit was taken for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping or total channel test measurement, provided such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either (1) inplace, onsite or offsite test measurements, or (2) utilizing replacement sensors with certified response times. Response time testing for the sensors as noted in Table 3.3.1-2 is not required based on the analysis in NEDO-32291-A. Response time testing for the remaining channel components is required as noted.

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

This specification ensures the effectiveness of the instrumentation used to mitigate the consequences of accidents by prescribing the OPERABILITY trip setpoints and response times for isolation of the reactor systems. When necessary, one channel may be inoperable for brief intervals to conduct required surveillance.

Specified surveillance intervals and maintenance outage times have been determined in accordance with NEDC-30851P, Supplement 2, "Technical Specification Improvement Analysis for BWR Instrumentation Common to RPS and ECCS Instrumentation" as approved by the NRC and documented in the NRC Safety Evaluation Report (SER) (letter to D.N. Grace from C.E. Rossi dated January 6, 1989) and NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," as approved by the NRC and documented in the NRC SER (letter to S.D. Floyd from C.E. Rossi dated June 18, 1990).

Automatic closure of the MSIVs upon receipt of a high-high radiation signal from the Main Steam Line Radiation Monitoring System was removed as the result of an analysis performed by General Electric in NEDO-31400A. The NRC approved the results of this analysis as documented in the SER (letter to George J. Beck, BWR Owner's Group from A.C. Thadani, NRC, dated May 15, 1991).

Some of the trip settings may have tolerances explicitly stated where both the high and low values are critical and may have a substantial effect on safety. The setpoints of other instrumentation, where only the high or low end of the setting have a direct bearing on safety, are established at a level away from the normal operating range to prevent inadvertent actuation of the systems involved.

Except for the MSIVs, the safety analysis does not address individual sensor response times or the response times of the logic systems to which the sensors are connected. For D.C. operated valves, a 3 second delay is assumed before the valve starts to move. For A.C. operated valves, it is assumed that the A.C. power supply is lost and is restored by startup of the emergency diesel generators. In this event, a time of 13 seconds is assumed before the valve starts to move. In addition to the pipe break, the failure of the D.C. operated valve is assumed; thus the signal delay (sensor response) is concurrent with the 10-second diesel startup and the 3 second load center loading delay. The safety analysis considers an allowable inventory loss in each case which in turn determines the valve speed in conjunction with the 13-second delay. It follows that checking the valve speeds and the 13-second time for emergency power establishment will establish the response time for the isolation functions.

Response time testing for sensors are not required based on the analysis in NEDO-32291-A. Response time testing of the remaining channel components is required as noted in Table 3.3.2-3.

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.

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

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. This specification provides the OPERABILITY requirements, trip setpoints and response times that will ensure effectiveness of the systems to provide the design protection. Although the instruments are listed by system, in some cases the same instrument may be used to send the actuation signal to more than one system at the same time.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

PECO ENERGY COMPANY

DOCKET NO. 50-353

LIMERICK GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 93
License No. NPF-85

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by PECO Energy Company (the licensee) dated August 8, 1996, as supplemented June 30, 1997 and August 26, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-85 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 93 , are hereby incorporated in the license. PECO Energy Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

Robert A. Capra, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the
Technical Specifications

Date of Issuance: December 14, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 93

FACILITY OPERATING LICENSE NO. NPF-85

DOCKET NO. 50-353

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
3/4 3-6	3/4 3-6
3/4 3-23	3/4 3-23
3/4 3-24	3/4 3-24
3/4 3-25	3/4 3-25
3/4 3-26	3/4 3-26
3/4 3-39	3/4 3-39
B 3/4 3-1	B 3/4 3-1
B 3/4 3-2	B 3/4 3-2

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME (Seconds)
1. Intermediate Range Monitors:	
a. Neutron Flux - High	N.A.
b. Inoperative	N.A.
2. Average Power Range Monitor*:	
a. Neutron Flux - Upscale, Setdown	N.A.
b. Neutron Flux - Upscale	
1) Flow Biased	≤0.09
2) High Flow Clamped	≤0.09
c. Inoperative	N.A.
d. Downscale	N.A.
3. Reactor Vessel Steam Dome Pressure - High	≤0.55
4. Reactor Vessel Water Level - Low, Level 3	≤1.05#
5. Main Steam Line Isolation Valve - Closure	≤0.06
6. DELETED	DELETED
7. Drywell Pressure - High	N.A.
8. Scram Discharge Volume Water Level - High	
a. Level Transmitter	N.A.
b. Float Switch	N.A.
9. Turbine Stop Valve - Closure	≤0.06
10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≤0.08**
11. Reactor Mode Switch Shutdown Position	N.A.
12. Manual Scram	N.A.

* Neutron detectors are exempt from response time testing. Response time shall be measured from the detector output or from the input of the first electronic component in the channel.

** Measured from start of turbine control valve fast closure.

\# Sensor is eliminated from response time testing for the RPS circuits. Response time testing and conformance to the administrative limits for the remaining channel including trip unit and relay logic are required.

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
1. MAIN STEAM LINE ISOLATION	
a. Reactor Vessel Water Level	
1) Low, Low - Level 2	N.A.
2) Low, Low, Low - Level 1	≤1.0###*
b. DELETED	DELETED
c. Main Steam Line Pressure - Low	≤1.0###*
d. Main Steam Line Flow - High	≤0.5###*
e. Condenser Vacuum - Low	N.A.
f. Outboard MSIV Room Temperature - High	N.A.
g. Turbine Enclosure - Main Steam Line Tunnel Temperature - High	N.A.
h. Manual Initiation	N.A.
2. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION	
a. Reactor Vessel Water Level Low - Level 3	N.A.
b. Reactor Vessel (RHR Cut-In Permissive) Pressure - High	N.A.
c. Manual Initiation	N.A.
3. REACTOR WATER CLEANUP SYSTEM ISOLATION	
a. RWCS Δ Flow - High	N.A.##
b. RWCS Area Temperature - High	N.A.
c. RWCS Area Ventilation Δ Temperature - High	N.A.
d. SLCS Initiation	N.A.
e. Reactor Vessel Water Level - Low, Low - Level 2	N.A.
f. Manual Initiation	N.A.

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
4. HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION	
a. HPCI Steam Line Δ Pressure - High	N.A.
b. HPCI Steam Supply Pressure - Low	N.A.
c. HPCI Turbine Exhaust Diaphragm Pressure - High	N.A.
d. HPCI Equipment Room Temperature - High	N.A.
e. HPCI Equipment Room Δ Temperature - High	N.A.
f. HPCI Pipe Routing Area Temperature - High	N.A.
g. Manual Initiation	N.A.
5. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION	
a. RCIC Steam Line Δ Pressure - High	N.A.
b. RCIC Steam Supply Pressure - Low	N.A.
c. RCIC Turbine Exhaust Diaphragm Pressure - High	N.A.
d. RCIC Equipment Room Temperature - High	N.A.
e. RCIC Equipment Room Δ Temperature - High	N.A.
f. RCIC Pipe Routing Area Temperature - High	N.A.
g. Manual Initiation	N.A.

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
6. PRIMARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level	
1) Low, Low - Level 2	N.A.
2) Low, Low, Low - Level 1	N.A.
b. Drywell Pressure - High	N.A.
c. North Stack Effluent Radiation - High	N.A.
d. Deleted	
e. Reactor Enclosure Ventilation Exhaust Duct - Radiation - High	N.A.
f. Deleted	
g. Deleted	
h. Drywell Pressure - High/ Reactor Pressure - Low	N.A.
i. Primary Containment Instrument Gas to Drywell Δ Pressure - Low	N.A.
j. Manual Initiation	N.A.
7. SECONDARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level Low, Low - Level 2	N.A.
b. Drywell Pressure - High	N.A.
c.1. Refueling Area Unit 1 Ventilation Exhaust Duct Radiation - High	N.A.
2. Refueling Area Unit 2 Ventilation Exhaust Duct Radiation - High	N.A.
d. Reactor Enclosure Ventilation Exhaust Duct Radiation - High	N.A.
e. Deleted	

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
f. Deleted	
g. Reactor Enclosure Manual Initiation	N.A.
h. Refueling Area Manual Initiation	N.A.

TABLE NOTATIONS

(a) DELETED

(b) DELETED

* Isolation system instrumentation response time for MSIV only. No diesel generator delays assumed for MSIVs.

** DELETED

Isolation system instrumentation response time specified for the Trip Function actuating each valve group shall be added to isolation time shown in Tables 3.6.3-1, 3.6.5.2.1-1 and 3.6.5.2.2-1 for valves in each valve group to obtain ISOLATION SYSTEM RESPONSE TIME for each valve.

With 45 second time delay.

Sensor is eliminated from response time testing for the MSIV actuation logic circuits. Response time testing and conformance to the administrative limits for the remaining channel including trip unit and relay logic are required.

TABLE 3.3.3-3

EMERGENCY CORE COOLING SYSTEM RESPONSE TIMES

ECCS		RESPONSE TIME (Seconds)
1.	CORE SPRAY SYSTEM	$\leq$ 27#
2.	LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM	$\leq$ 40#
3.	AUTOMATIC DEPRESSURIZATION SYSTEM	N.A.
4.	HIGH PRESSURE COOLANT INJECTION SYSTEM	$\leq$ 60#
5.	LOSS OF POWER	N.A.

ECCS actuation instrumentation is eliminated from response time testing.

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

The reactor protection system automatically initiates a reactor scram to:

a. Preserve the integrity of the fuel cladding.

b. Preserve the integrity of the reactor coolant system.

c. Minimize the energy which must be adsorbed following a loss-of-coolant accident, and

d. Prevent inadvertent criticality.

This specification provides the limiting conditions for operation necessary to preserve the ability of the system to perform its intended function even during periods when instrument channels may be out of service because of maintenance. When necessary, one channel may be made inoperable for brief intervals to conduct required surveillance.

The reactor protection system is made up of two independent trip systems. There are usually four channels to monitor each parameter with two channels in each trip system. The outputs of the channels in a trip system are combined in a logic so that either channel will trip that trip system. The tripping of both trip systems will produce a reactor scram. The system meets the intent of IEEE-279 for nuclear power plant protection systems. Specified surveillance intervals and surveillance and maintenance outage times have been determined in accordance with NEDC-30851P, "Technical Specification Improvement Analyses for BWR Reactor Protection System," as approved by the NRC and documented in the NRC Safety Evaluation Report (SER) (letter to T. A. Pickens from A. Thadani dated July 15, 1987. The bases for the trip settings of RPS are discussed in the bases for Specification 2.2.1.

Automatic reactor trip upon receipt of a high-high radiation signal from the Main Steam Line Radiation Monitoring System was removed as the result of an analysis performed by General Electric in NEDO-31400A. The NRC approved the results of this analysis as documented in the SER (letter to George J. Beck, BWR Owner's Group from A.C. Thadani, NRC, dated May 15, 1991).

The measurement of response time at the specified frequencies provides assurance that the protective functions associated with each channel are completed within the time limit assumed in the safety analyses. No credit was taken for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping or total channel test measurement, provided such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either (1) inplace, onsite or offsite test measurements, or (2) utilizing replacement sensors with certified response times. Response time testing for the sensors as noted in Table 3.3.1-2 is not required based on the analysis in NEDO-32291-A. Response time testing for the remaining channel components is required as noted.

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

This specification ensures the effectiveness of the instrumentation used to mitigate the consequences of accidents by prescribing the OPERABILITY trip setpoints and response times for isolation of the reactor systems. When necessary, one channel may be inoperable for brief intervals to conduct required surveillance.

Specified surveillance intervals and maintenance outage times have been determined in accordance with NEDC-30851P, Supplement 2, "Technical Specification Improvement Analysis for BWR Instrumentation Common to RPS and ECCS Instrumentation" as approved by the NRC and documented in the NRC Safety Evaluation Report (SER) (letter to D.N. Grace from C.E. Rossi dated January 6, 1989) and NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," as approved by the NRC and documented in the NRC SER (letter to S.D. Floyd from C.E. Rossi dated June 18, 1990).

Automatic closure of the MSIVs upon receipt of a high-high radiation signal from the Main Steam Line Radiation Monitoring System was removed as the result of an analysis performed by General Electric in NEDO-31400A. The NRC approved the results of this analysis as documented in the SER (letter to George J. Beck, BWR Owner's Group from A.C. Thadani, NRC, dated May 15, 1991).

Some of the trip settings may have tolerances explicitly stated where both the high and low values are critical and may have a substantial effect on safety. The setpoints of other instrumentation, where only the high or low end of the setting have a direct bearing on safety, are established at a level away from the normal operating range to prevent inadvertent actuation of the systems involved.

Except for the MSIVs, the safety analysis does not address individual sensor response times or the response times of the logic systems to which the sensors are connected. For D.C. operated valves, a 3 second delay is assumed before the valve starts to move. For A.C. operated valves, it is assumed that the A.C. power supply is lost and is restored by startup of the emergency diesel generators. In this event, a time of 13 seconds is assumed before the valve starts to move. In addition to the pipe break, the failure of the D.C. operated valve is assumed; thus the signal delay (sensor response) is concurrent with the 10-second diesel startup and the 3 second load center loading delay. The safety analysis considers an allowable inventory loss in each case which in turn determines the valve speed in conjunction with the 13-second delay. It follows that checking the valve speeds and the 13-second time for emergency power establishment will establish the response time for the isolation functions.

Response time testing for sensors are not required based on the analysis in NEDO-32291-A. Response time testing of the remaining channel components is required as noted in Table 3.3.2-3.

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.

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

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. This specification provides the OPERABILITY requirements, trip setpoints and response times that will ensure effectiveness of the systems to provide the design protection. Although the instruments are listed by system, in some cases the same instrument may be used to send the actuation signal to more than one system at the same time.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 132 AND 93 TO FACILITY OPERATING

LICENSE NOS. NPF-39 AND NPF-85

PECO ENERGY COMPANY

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated August 8, 1996, as supplemented by letters dated June 30, 1997, and August 26, 1998, PECO Energy Company (the licensee) submitted a request for changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TSs). Additional information was received on June 30, 1997 and August 26, 1998, in response to telephone conversations with the staff and a Request for Additional Information (RAI) dated September 3, 1997. The proposed TS modifications will eliminate response time testing (RTT) requirements for selected sensors and specified instrumentation loops for 1) the Reactor Protection System (RPS), 2) the Isolation System, and 3) the Emergency Core Cooling System (ECCS). The June 30, 1997 and August 26, 1998 letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The Boiling Water Reactor Owner's Group (BWROG) performed an analysis to assess the impact of elimination of RTT for selected instrument loops. This analysis was documented as Licensing Topical Report NEDO-32291, "System Analyses for Elimination of Selected Response Time Testing Requirements," and was submitted for the Nuclear Regulatory Commission (NRC) approval in January 1994. The NRC approved NEDO-32291 in a generic Safety Evaluation Report (SER) dated December 28, 1994 and approved subsequent revisions to NEDO-32291 in a supplemental SER dated May 31, 1995. The generic SER included Tables 1 and 2, which respectively lists the make/model of instruments/devices, and systems which were evaluated in NEDO-32291 for RTT elimination. The generic SER states, "The BWROG concluded that the RTT requirements for the devices identified in Table 1 can be removed from the TSs when the devices are used in systems listed in Table 2." In addition to approving elimination of RTT for selected instrumentation, the generic SER stipulated certain conditions that individual plant licensees must meet when implementing the NEDO-32291 guidelines on a plant-specific basis.

3.0 EVALUATION

As approved by the staff, NEDO-32291 indicated that RTT can be eliminated for the following based on other TS testing which is sufficient to detect instrumentation response degradation:

1. All ECCS instrument loops;
2. All Isolation System actuation instrument loops except for main steamline isolation valves (MSIVs);
3. Sensors for selected RPS actuation; and
4. Sensors for MSIV closure actuation.

The licensee proposed elimination of the following selected response time testing requirements from the LGS Units 1 & 2 TSs:

1. All ECCS actuation instrumentation.
2. Sensors for selected RPS actuation instrumentation.
3. Sensors for selected MSIV closure actuation instrumentation.

3.1 Specific Changes

The specific sections of the LGS Units 1 & 2 TSs to be changed are as follows:

(a) TS Section 3/4.3.1, "Reactor Protection System Instrumentation," Table 3.3.1-2, "Reactor Protection System Response Times," will be revised to eliminate response time testing for applicable sensors for Reactor Vessel Water Level - Low, Level 3.

<u>Proposed Change</u>: On functional unit 4, Reactor Vessel Water level - Low, Level 3, change the response time from "≤ 1.05" to "≤ 1.05#". Add a footnote to the page:

> Sensor is eliminated from response time testing for the RPS circuits. Response time testing and conformance to administrative limits for the remaining channel including trip unit and relay logic are required.

<u>Evaluation</u>: This footnote will allow LGS Units 1 & 2 to use manufacturer's response time data, or historical response time data as a substitute for actual measured sensor response time when determining the overall system response time, and therefore eliminate the requirement for a separate measurement of the sensor response time. The remainder of the channel will continue to be tested for response time. This change is consistent with the approved NEDO-32291. The staff finds this acceptable.

(b) TS Bases Section 3/4.3.1, "Reactor Protection System Instrumentation," will be revised to make reference to NEDO-32291, as applicable.

<u>Proposed Change:</u>

Bases Section 3/4.3.1, "Reactor Protection System Instrumentation," page B 3/4 3-1, last paragraph, will have two lines added. The paragraph will change from:

> The measurement of response time at the specified frequencies provides assurance that the protective functions associated with each channel are completed within the time limit assumed in the safety analyses. No credit was taken for those channels with response times indicated as not applicable. Response time may be

> demonstrated by any series of sequential, overlapping or total channel test measurement, provided such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either (1) inplace, onsite or offsite test measurements, or (2) utilizing replacement sensors with certified response times.

to now read:

> The measurement of response time at the specified frequencies provides assurance that the protective functions associated with each channel are completed within the time limit assumed in the safety analyses. No credit was taken for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping or total channel test measurement, provided such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either (1) inplace, onsite or offsite test measurements, or (2) utilizing replacement sensors with certified response times. Response time testing for the sensors as noted In Table 3.3.1-2 is not required based on the analysis in NEDO-32291-A. Response time testing for the remaining channel components is required as noted.

Evaluation: This change in the wording will allow LGS Units 1& 2 to use manufacturer's response time data, or historical response time data as a substitute for actual measured sensor response time when determining the overall system response time, and therefore eliminate the requirement for a separate measurement of the sensor response time. The remainder of the channel will continue to be tested for response time. This change is consistent with the approved NEDO-32291. The staff finds this acceptable.

c) TS Section 3/4.3.2, "Isolation Actuation Instrumentation," Table 3.3.2-3, will be revised to eliminate response time testing for applicable sensors for Reactor Vessel Water Level - Low, Level 1, and Level 2; Main Steam Line Pressure - Low; and Main Steam Line Flow - High. Instrumentation response time requirements for the Residual Heat Removal (RHR) Shutdown Cooling Mode Isolation, Reactor Water Cleanup (RWCU) System Isolation, High Pressure Coolant Injection (HPCI) System Isolation, Reactor Core Isolation Cooling (RCIC) System Isolation, and Primary Containment Isolation will be eliminated as a result of the proposed TS changes. Further, table notations "a" and "**" will be deleted and "###" will be added to reflect these changes.

Proposed Change: Table 3.3.2-3, "Isolation System Instrumentation Response Time," pages 3/4 3-23 through 3/4 3-26, will have the following changes:

TRIP FUNCTION			RESPONSE TIME FROM	TO
1.	Main Steam Line Isolation			
	a.	Reactor Vessel Water Level		
		1) Low, Low - Level 2	13	N.A.
		2) Low, Low, Low - Level 1	≤1.0*/≤13[(a)]**	≤1.0###*
	c.	Main Steam Line Pressure - Low	≤1.0*/≤13[(a)]**	≤1.0###*
	d.	Main Steam Line Flow - High	≤0.5*/≤13[(a)]**	≤0.5###*
2.	RHR System Shutdown Cooling Mode Isolation			
	a.	Reactor Vessel Water Level Low - Level 3	≤13[(a)]	N.A.
3.	Reactor Water Cleanup System Isolation			
	a.	RWCU Δ Flow - High	≤13##	##N.A.
	e.	Reactor Vessel Water Level Low, Low - Level 2	≤13[(a)]	N.A.
4.	High Pressure Coolant Injection System Isolation			
	a.	HPCI Steam Line Δ Pressure - High	≤13[(a)]	N.A.
	b.	HPCI Steam Supply Pressure - Low	≤13[(a)]	N.A.
5.	Reactor Core Isolation Cooling System Isolation			
	a.	RCIC Steam Line Δ Pressure - High	≤13[(a)]	N.A.
	b.	RCIC Steam Supply Pressure - Low	≤13[(a)]	N.A.
6.	Primary Containment Isolation			
	a.	Reactor Vessel Water Level		
		1) Low, Low - Level 2	≤13[(a)]	N.A.
		2) Low, Low, Low - Level 1	≤13[(a)]	N.A.
	b.	Drywell Pressure - High	≤13[(a)]	N.A.

The Table Notations on page 3/4 3-26, will have the following changes:

1. Footnote (a) will be deleted.

2. Footnote ** will be deleted.

3. Add a new footnote ### under note ##. The note will read:

   ### Sensor is eliminated from response time testing for the MSIV actuation logic circuits. Response time testing and conformance to administrative limits for the remaining channel including trip unit and relay logic are required.

Evaluation: The change in the time requirement to "N/A" will allow LGS Units 1 and 2 to use manufacturer's response time data, or historical response time data as a substitute for actual measured instrument channel response time when determining the overall system response time, and therefore eliminate the requirement for a separate measurement of the response time. It should be noted that in some sections of the basis, such as section 3/4.3.3, Reactor Protection System instrumentation, the term "N/A" is defined as meaning that no credit is taken for this function. This section states, in paragraph 4, that "no credit was taken for those channels with response times indicated as not applicable." No such statement is present in the basis for the isolation actuation instrumentation, and therefore the use of the "N/A" notation is acceptable to the staff. Addition of the "###" footnote will allow elimination of the sensor RTT in those cases where the remainder of the channel still requires testing. These changes are consistent with the approved NEDO-32291. The staff finds them acceptable.

d) TS Bases Section 3/4.3.2, "Isolation Actuation Instrumentation," will be revised to make reference to NEDO-32291, as applicable.

   Proposed Change: Basis section 3/4.3.2, "Isolation Actuation Instrumentation," page B 3/4 3-2, will have an additional paragraph added between the current fifth and sixth paragraphs. The end of this section now reads:

   Except for the MSIVs, the safety analysis does not address individual sensor response times or the response times of the logic systems to which the sensors are connected. For D.C. operated valves, a 3 second delay is assumed before the valve starts to move. For A.C. operated valves, it is assumed that the A.C. power supply is lost and is restored by startup of the emergency diesel generators. In this event, a time of 13 seconds is assumed before the valve starts to move. In addition to the pipe break, the failure of the D.C. operated valve is assumed; thus the signal delay (sensor response) is concurrent with the 10-second diesel startup and the 3 second load center loading delay. The safety analysis considers an allowable inventory loss in each case which in turn determines the valve speed in conjunction with the 13-second delay. It follows that checking the valve speeds and the 13-second time for emergency power establishment will establish the response time for the isolation functions.

   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.

The end of section 3/4.3.2 will now read:

> Except for the MSIVs, the safety analysis does not address individual sensor response times or the response times of the logic systems to which the sensors are connected. For D.C. operated valves, a 3 second delay is assumed before the valve starts to move. For A.C. operated valves, it is assumed that the A.C. power supply is lost and is restored by startup of the emergency diesel generators. In this event, a time of 13 seconds is assumed before the valve starts to move. In addition to the pipe break, the failure of the D.C. operated valve is assumed; thus the signal delay (sensor response) is concurrent with the 10-second diesel startup and the 3 second load center loading delay. The safety analysis considers an allowable inventory loss in each case which in turn determines the valve speed in conjunction with the 13-second delay. It follows that checking the valve speeds and the 13-second time for emergency power establishment will establish the response time for the isolation functions.
>
> Response time testing for sensors are not required based on the analysis in NEDO-32291-A. Response time testing of the remaining channel components is required as noted in Table 3.3.2-3.
>
> 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.

Evaluation: This change is only to make reference to NEDO-32291, and therefore explain the basis and background for the modification of the TS's. The staff finds this change acceptable.

e) TS Section 3/4.3.1, Table 3.3.3-3, "Emergency Core Cooling System Response Times," will be revised to include an annotation indicating that ECCS actuation instrumentation is eliminated from RTT for Core Spray (CS), Low Pressure Coolant Injection (LPCI) system, and HPCI system.

Proposed Change: Table 3.3.3-3, "Emergency Core Cooling System Response Times," page 3/4 3-39, will have the following changes:

	TRIP FUNCTION	RESPONSE TIME (Seconds) FROM	TO
1.	Core Spray System	≤ 27	≤ 27 #
2.	Low Pressure Coolant Injection Mode of RHR System	≤ 40	≤ 40 #
4.	High Pressure Coolant Injection System	≤ 60	≤ 60 #

A footnote # will be added. The note will read:

> "# ECCS actuation Instrumentation is eliminated from response time testing."

Evaluation: The addition of the notation to the response time requirement and the addition of the note "#" will allow LGS Units 1& 2 to use manufacturer's response time data, or historical response time data as a substitute for actual measured actuation instrumentation response time when determining the overall system response time, and therefore eliminate the requirement for a separate measurement of the actuation instrumentation response time. The remainder of the system will continue to be tested for response time. This change is consistent with the approved NEDO-32291. The staff finds this acceptable.

3.2 Additional Instruments Not Listed in Staff SER

The licensee, in their request for elimination of RTT, included sensors not specifically discussed in NEDO-32291, and therefore not listed in Table 1 of the staff SER for NEDO-32291. The licensee's August 8, 1996, submittal included Amerace ETR, EGP, and GPI relays, Bailey 745 Switch, and the GE CR2940 relay for RTT elimination. This was instrumentation not listed in NEDO-32291 and, therefore, not approved in the staff SER.

In the August 26, 1998, letter responding to the staff RAI, the licensee stated:

> In our submittal for elimination of selected RTT we requested that various Amerace ETR, EGP and GP relays be eliminated. Amerace is used in the LGS component record list (CRL) description of these instruments from which our submittal tables were developed. Amerace is the manufacturer of Agastat GP/EGP family of relays that are part identified in our request. Therefore, all EGP and GP/GPI Agastat relays identified in our submittal request as Amerace are bounded by the SER Table 1. Likewise, the Bailey 745 'Switch' description used in the LGS CRL is identified in the NEDO and is identified in the SER Table 1 as a 745 'Alarm Unit' under 'External Devices.' Therefore, the Bailey 745 'Switches" referenced in Table 1 of our submittal request are bounded by the SER Table 1.
>
> Our original submittal incorrectly identified various ETR relays in the HPCI (Table 2) and RCIC (Table 4) Steam Line DP-High. In accordance with NEDO-32291, Chapter 7, time delay relays are not to be included in elimination of RTT because they require calibration for response verification and to assure setpoint accuracy. The time delay relays are also tested as part of Logic System Functional Tests. Therefore, in accordance with the NEDO, we withdraw the associated ETR relays from our request. Likewise, the GE CR2940 relays identified in our submittal Table 1 - NSSS RWCU Differential Flow-High are switches, not relays, and are not identified in the SER Table 1. Therefore, in accordance with the NEDO, we withdraw the associated GE CR2940 switches from our request.
>
> There are no changes necessary to the TS marked-up pages that were provided as part of our submittal."

The above explanation is acceptable to the staff since it confirms that the additional equipment proposed for RTT elimination is covered by the NEDO-32291 analysis, and therefore, inclusion of the Amerace ETR, EGP and GPI relays and the Bailey 745 Switch in this request for elimination of RTT is acceptable .

3.3 Use of Anticipated Response Times other than Manufactures Design Response Times

The licensee stated that in some instances, manufacturer's design response time data is not available. In those instances, the licensee proposed using a response time value based upon actual values measured during past response time tests at LGS Units 1 and 2. The licensee provided the data for actual response times by letter dated August 26, 1998, as a response to the staff RAI dated September 3, 1997. In addition, the licensee stated:

> The estimated response time that will be used for those portions of the system no longer tested, when determining overall system response time, is listed in Table 1.
>
> The value for estimated response time for the RWCU differential flow trip function is based on historical test data. This value is a combined value for the Bailey Controls trip units, square root converters, signal converters, Agastat (Amerace) relays, and Eagle Timers used to provide the trip functions. A sample of response time test data from 1992-1996 was retrieved and evaluated using standard MATHCAD (Version 6) functions for determining the mean (mean) and standard deviation (stdev) for a sample population. The estimated response time was verified to be greater than the mean plus two standard deviations. Refer to Exhibit page 6 for the sample data, evaluation, and results.
>
> The values for estimated response time for Rosemount differential pressure transmitters are based on historical test data. A sample of response time data from 1992-1998 was retrieved and evaluated using standard MATHCAD (Version 6) functions as described in the previous paragraph. Separate evaluations are provided to correspond to groupings of trip functions and allotted response times used in the response time test procedures. Refer to Exhibit pages 1-5 for the sample data, evaluations, and results.
>
> The value for estimated response time for Rosemount trip units is based on engineering judgment. The value is supported by testing performed by General Electric Co., to support the Analog Transmitter/Trip Unit System For Engineered Safeguard Sensor Trip Inputs upgrade project in LTR NEDO-21617-A. Testing of a model 510 master/slave trip unit tandem combination resulted in a maximum measured time delay of 1.5 msec. A more conservative value of 2 msec will be used. Based on the similarity of design of the model 510 and 710 trip units, this estimated response time will also be used for model 710 trip units. Response time test procedures verify the combined response time of trip units and Agastat relays. Consequently, historic response time data is not available for the trip unit alone. However, since the response time of the trip unit is expected to be two orders of magnitude less than the transmitter response time, and 3-4 orders of magnitude less

than the trip function response time, the trip unit contribution to trip function response time is insignificant.

The value for estimated response time for Agastat (Amerace) general purpose relays is based on manufacturer's supplied data.

These administrative values for actual response time were established based upon review of LGS operating historical response time data. The staff requested that LGS determine a statistically valid administrative value by determination of the mean and 2 sigma standard deviation value of response time (value which represents 95% confidence level by definition). The staff then determined the one-sided tolerance limit factor for a normal distribution for a 95/95% confidence level. This was done using guidance in "Applying Statistics," NUREG-1475, Table T-11b: One sided tolerance limit factor for a normal distribution.

The results of these calculations are as shown below:

Sensor	Rosemount 1153/1151, RC 5/9
Function	High Drywell Pressure High Reactor Pressure HPCI Steam Supply Pressure RCIC Steam Supply Pressure Low Reactor Pressure RWCU Flow HPCI Steam Supply Flow RCIC Steam Supply Flow
Mean	71.03
Std Dev	60.10
Mean + 2*Std Dev	191.23
Sample Size	87
One sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	1.950
One sided tolerance limit	188 mSec.
LGS administrative response time value	200 mSec.

Sensor	Rosemount 1153/1151, RC 5
Function	Reactor Vessel Water Level
Mean	93.33
Std Dev	42.90
Mean + 2*Std Dev	179.14
Sample Size	24
One sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.309
One sided tolerance limit	192 mSec.
LGS administrative response time value	230 mSec.

Sensor	Rosemount 1153/1151, RC 7
Function	MSL Flow

Mean	80.52
Std Dev	95.68
Mean + 2*Std Dev	271.88
Sample Size	96
One sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	1.934
One sided tolerance limit	266
LGS administrative response time value	355 mSec

Sensor	Rosemount 1153/1151, RC 4
Function	Reactor Vessel Water Level
Mean	122.5
Std Dev	84.09
Mean + 2*Std Dev	290.69
Sample Size	24
One sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.309
One sided tolerance limit	194 mSec.
LGS administrative response time value	450 mSec.

Sensor	Rosemount 1153/1151, RC 5
Function	Reactor Vessel Water Level
Mean	162.71
Std Dev	133.40
Mean + 2*Std Dev	429.50
Sample Size	48
One sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.081
One sided tolerance limit	440 mSec.
LGS administrative response time value	480 mSec.

Sensor	Bailey 745 Trip Unit Bailey 752 Converter Bailey 750 Square Rooter Agastat GPI Relay
Function	RWCU Differential Flow - High
Mean	45.06
Std Dev	.645
Mean + 2*Std Dev	46.351
Sample Size	22
One sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.349
One sided tolerance limit	45.58 seconds
LGS administrative response time value	47 seconds

In each case, the LGS administrative response time value is more conservative than the one-sided tolerance limit, and therefore, the licensee's values are acceptable to the staff.

4.0 VERIFICATION OF NEDO-32291 PLANT-SPECIFIC CONDITIONS

The staff stipulated several conditions in the generic SER approving NEDO-32291 which must be met by the individual licensee referencing NEDO-32291 before its guidance could be implemented in plant-specific TS change proposals. From the LGS Units 1 & 2 licensee submittals, the staff verified that the licensee has met the applicable conditions as follows:

4.1 Condition: Confirm the applicability of the generic analyses to the plant.

Licensee's Response: PECO Energy Company has confirmed the generic applicability of NEDO-32291 to LGS, Units 1 and 2. As indicated in Appendix A of NEDO-32291, PECO Energy Company was a participating utility in this evaluation. PECO Energy Company has also confirmed that the components discussed within the scope of this TS change request have been evaluated in NEDO-32291.

The staff concurs with this response.

4.2 Condition: The licensee's revision request shall be submitted as shown in Appendix I of the BWROG LTR.

The staff has determined that the submittal fulfills this condition.

4.3 Condition: The licensee shall state that they are following the recommendations from EPRI NP-7243 and, therefore, shall perform the following actions:

(a) Prior to installation of a new transmitter/switch or following refurbishment of a transmitter/switch (e.g., sensor cell or variable damping components), a hydraulic RTT shall be performed to determine an initial sensor-specific response time value.

Licensee Response: "Prior to installation of a new transmitter/switch or following refurbishment of a transmitter/switch (e.g., sensor cell or variable damping components), a hydraulic response time test will be performed to determine an initial sensor-specific response time value. If this TS change request is approved, the applicable LGS, Units 1 and 2, procedures will be revised, as appropriate, to incorporate this recommendation in conjunction with implementing the proposed TS changes."

The staff concurs that when these procedure changes are made, this condition will be met.

(b) For transmitters and switches that use capillary tubes, capillary tube testing shall be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

Licensee Response: "For transmitters and switches that use capillary tubes, capillary tube testing shall be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes. For those transmitters and switches within the scope of this proposed TS change that utilize capillary tubes, capillary tube testing will be performed after installation and after any maintenance or modification activity, as appropriate."

The staff concurs that this response meets the above condition.

4.4 Condition: The licensee must confirm the following:

(a) That calibration is being done with equipment designed to provide a step function or fast ramp in the process variable,

Licensee Response: "Applicable station calibration procedures will be revised, as appropriate, to include guidance to input a fast ramp or step change to system components during calibration. This new guidance will ensure that the response of the transmitter(s) to an input signal (i.e., fast ramp or step input change) is prompt, and in all cases occurs within less than five (5) seconds."

The staff concurs that when these procedure changes are made, this condition will be met.

(b) That provisions have been made to ensure that operators and technicians, through an appropriate training program, are aware of the consequences of instrument response time degradation, and that applicable procedures have been reviewed and revised as necessary to assure that technicians monitor for response time degradation during the performance of calibrations and functional tests,

Licensee Response: "The applicable station calibration procedures will be revised, as appropriate, to assure that technicians monitor for response degradation during the performance of calibrations and functional tests. Any necessary procedure revisions will be completed in conjunction with implementing the proposed TS changes."

The staff concurs that when these procedure changes are made, this condition will be met.

(c) That surveillance testing procedures have been reviewed and revised if necessary to ensure calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of units under test,

Licensee Response: "Surveillance testing procedures will be revised, as appropriate, to ensure that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of components being tested."

The staff concurs that when these procedure changes are made, this condition will be met.

(d) That for any request involving the elimination of RTT for Rosemount pressure transmitters, the licensee is in compliance with the guidelines of Supplement 1 to NRC Bulletin 90-01, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount."

Licensee Response: PECO Energy Company's compliance with the guidance stipulated in NRC Bulletin 90-01, Supplement 1, was reviewed by the staff as documented In a letter dated November 19, 1993. The staff's evaluation of the response to NRC Bulletin 90-01, Supplement 1, concluded that PECO Energy's actions satisfied the requested actions specified in Supplement 1.

The staff concurs that this condition has been met.

(e) That for those instruments where the manufacturer recommends periodic RTT as well as calibration to ensure correct functioning, the licensee has ensured that elimination of RTT is nevertheless acceptable for the particular application involved.

Licensee Response: PECO Energy Company reviewed the vendor recommendations for those devices for which RTT elimination is proposed and confirmed that there are no manfacturer recommendations for periodic response time testing.

The staff concurs that this condition has been met.

5.0 SUMMARY

Based upon the above review, the staff concludes that the licensee has followed the provisions of the generic SER and plant-specific considerations for RTT elimination in accordance with NEDO-32291. Therefore, the staff concludes that the proposed LGS Units 1 & 2 TS modifications for selected instrument RTT elimination are acceptable.

6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

7.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (61 FR 57489). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Date: December 14, 1998