

# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9704220043      DOC. DATE: 97/04/14      NOTARIZED: NO      DOCKET #  
 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv      05000387  
           50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylv      05000388  
 AUTH. NAME                      AUTHOR AFFILIATION  
 BYRAM, R.G.                      Pennsylvania Power & Light Co.  
 RECIP. NAME                      RECIPIENT AFFILIATION  
    Document Control Branch (Document Control Desk)

SUBJECT: Provides supplemental info to 970407 license amend request  
           re clarification of scope of response time testing.  
           Calculation, encl.

DISTRIBUTION CODE: A001D      COPIES RECEIVED: LTR 1 ENCL 1      SIZE: 7+29  
 TITLE: OR Submittal: General Distribution

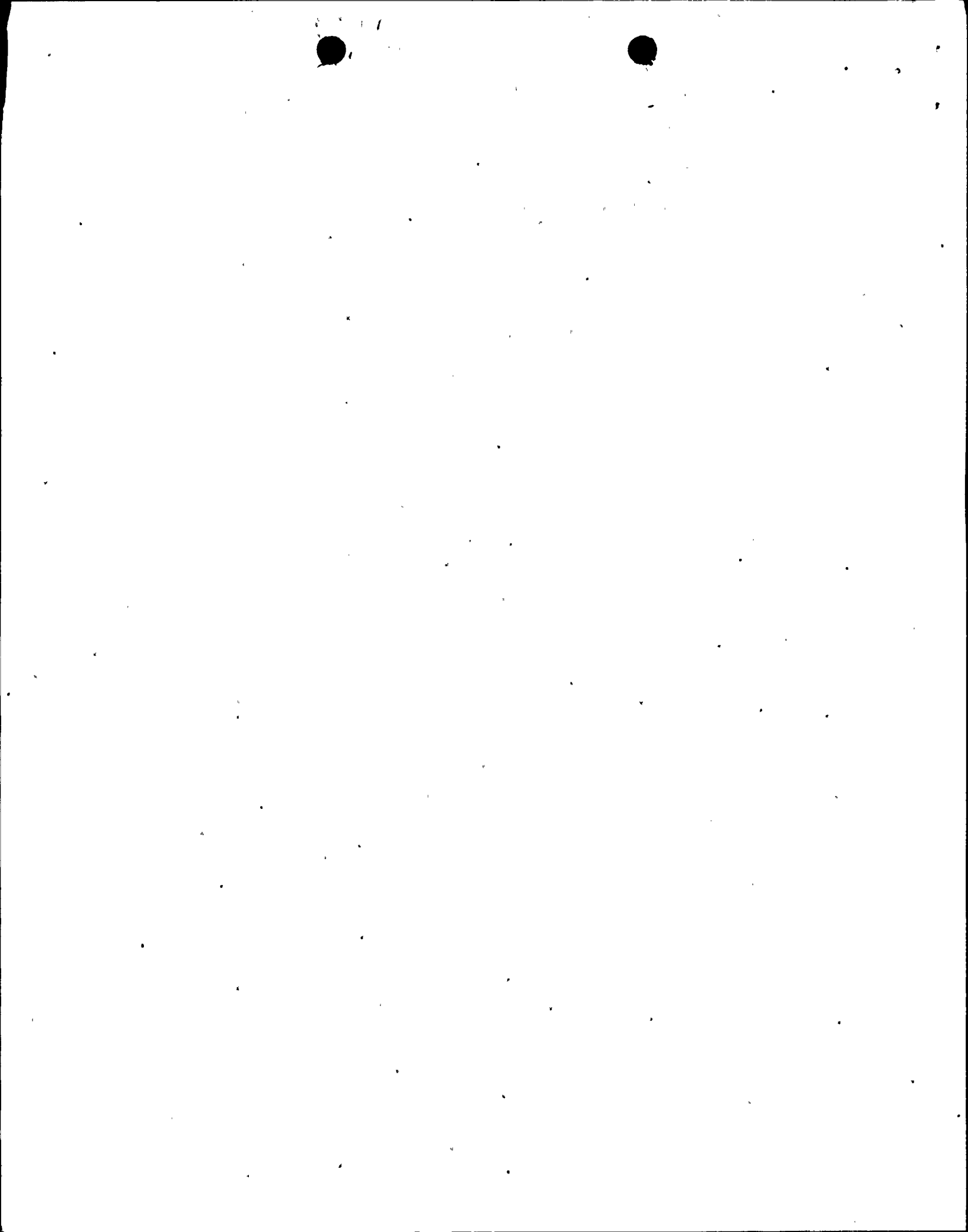
NOTES: 05000387

	RECIPIENT ID CODE/NAME	COPIES	L	T	R	ENCL	RECIPIENT ID CODE/NAME	COPIES	L	T	R	ENCL
	PD1-2 LA	1		1			PD1-2 PD	1		1		
	POSUSNY, C	1		1								
INTERNAL:	ACRS	1		1			FILE CENTER 01	1		1		
	NRR/DE/ECGB/A	1		1			NRR/DE/EMCB	1		1		
	NRR/DRCH/HICB	1		1			NRR/DSSA/SPLB	1		1		
	NRR/DSSA/SRXB	1		1			NUDOCS-ABSTRACT	1		1		
	OGC/HDS2	1		0								
EXTERNAL:	NOAC	1		1			NRC PDR	1		1		
NOTES:		1		1								

NOTE TO ALL "RIDS" RECIPIENTS:  
 PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS  
 OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL  
 DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTR 15 ENCL 14

C  
A  
T  
E  
G  
O  
R  
Y  
1  
D  
O  
C  
U  
M  
E  
N  
T





# Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101-1179 • 610/774-5151

Robert G. Byram  
Senior Vice President  
Generation and Chief Nuclear Officer  
610/774-7502  
Fax: 610/774-5019

APR 14 1997

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
SUPPLEMENTAL INFORMATION SUPPORTING  
PROPOSED AMENDMENT NOS. 205 AND 168  
CLARIFICATION OF THE SCOPE OF RESPONSE TIME TESTING  
PLA-4608**

Docket Nos. 50-387  
and 50-388

**FILES R41-2/A17-2**

- Reference: (1) PP&L Letter PLA-4597, "Proposed Amendment No. 205 To License NPF-14 and Proposed Amendment No. 168 To License NPF-22: Clarification Of The Scope Of Response Time Testing," dated April 4, 1997.
- (2) NRC Letter to BWR Owner's Group, dated December 28, 1994, transmitting Evaluation of Licensing Topical Report NEDO-32291, "System Analyses for Elimination of Selected Response Time Testing Requirements."
- (3) NRC Letter to PP&L, dated July 11, 1995, issuing Amendments No. 148 to Facility Operating License NPF-14 and No. 118 to Facility Operating License NPF-22.
- (4) Generic Letter 93-08, "Relocation of Technical Specification Tables of Instrument Response Time Limits," dated December 29, 1993.
- (5) BWR Owner's Group Licensing Topical Report NEDO-32291, "System Analyses for Elimination of Selected Response Time Testing Requirements," dated January 1994.

The purpose of this letter is to provide supplemental information to support the NRC review of proposed changes to Susquehanna Steam Electric Station (SSES) Unit 1 and Unit 2 Technical Specifications clarifying the scope of response time testing. Submittal of this information was agreed to by PP&L at a teleconference on April 10, 1997 with your Messrs. Poslusny, Loeser and Schulten. The proposed changes to Unit 1 and Unit 2 Technical Specifications were submitted via Reference No. 1

This letter provides information on three topics discussed at the April 10, 1997 teleconference:

- (1) PP&L's Application of the B2T Sensor
- (2) Derivation of Sensor Response Time Administrative Values
- (3) PP&L's "Response" to Implementation Requirements Delineated in the NRC Safety Evaluation Report (Reference No. 2)

9704220043 970414  
PDR ADOCK 05000387  
P PDR



ADDI

Topic No. 1 -- PP&L's Application of the B2T Sensor

The only application at SSES for the B2T model device is the Reactor Protection System -- Reactor Steam Dome High Pressure function, for which sensor response time testing requirements have not been eliminated.

Topic No. 2 -- Derivation of Sensor Response Time Administrative Values

For those channels whose sensor response time tests have been eliminated, but for which relay response time testing is still required, an assumed administrative value for sensor response time is required. These administrative values, or 'penalties,' were invoked to account for the sensor response time in the total channel response time calculations. This is applicable to the Reactor Protection System: Reactor Vessel Water Level - Low Level criteria, the Main Steam Line Isolation: Reactor Vessel Water Level -Low Low Low, Level 1 channel, the Main Steam Line Isolation: Main Steam Line Pressure - Low channel, and the Main Steam Line Isolation: Main Steam Line Flow - High channel. The table below lists each of these signals, along with the total channel response time limit listed in the FSAR, and the administrative value for the sensor response time.

FUNCTION NAME	INSTRUMENT MODEL	ADMINISTRATIVE VALUE ASSUMED FOR INSTRUMENT RESPONSE TIME	TOTAL CHANNEL RESPONSE TIME
Reactor Protection System: Reactor Vessel Water Level - Low Level 3	Barton Model 288A	600 milliseconds	1.05 seconds
Main Steam Line Isolation: Reactor Vessel Water Level - Low Low Low, Level 1	Barton Model 760	600 milliseconds	1 second
Main Steam Line Isolation: Main Steam Line Pressure - Low	Barksdale Model BIT-M12SS-GE	100 milliseconds	1 second
Main Steam Line Isolation: Main Steam Line Flow - High	Barton Model 288A	200 milliseconds	500 milliseconds

In order to determine an assumed administrative value for sensor response time, PP&L reviewed the operational history (i.e., the measured response times) since 1987. (Note that the necessary "design" data from the manufacturer was not available.) This data was evaluated to determine the longest sensor response time and the longest relay response time for each of the channels. The sensor 'penalty' (i.e., the now assumed sensor response time), was selected based upon the longest sensor and relay response times. This 'penalty' value was then added to PP&L's procedures for calculating total channel response time.

For example, the longest instrument response time test result for the Reactor Protection System Reactor Vessel Low Level 3 channels (level switches A-D on both units) is 556 milliseconds. For

the purpose of establishing an administrative value for sensor response time testing, this number was rounded up to 600 milliseconds to determine the assumed penalty. The relay response time test acceptance criterion is the remaining portion of the allowable channel response time (in this example, 1.05 seconds less 600 milliseconds, or 450 milliseconds). Should the relay response time test results exceed this value, the channel would be declared inoperable and the appropriate Technical Specification LCO Action Statements would be entered.

In response to a request from the NRC staff, PP&L performed an additional statistical analysis to ensure that the selected administrative values for sensor response time were conservative, based on the PP&L empirical data. PP&L calculated a 95% confidence value, and concluded that the administrative limits assumed for the sensor response time were conservative relative to the statistically-determined response times.

At the request of the NRC staff reviewer, the attachment to this letter contains PP&L Calculation No. EC-058-1011, "Sensor Response Time Values for Select RPS and MSIV Isolation Functions." This calculation documents the statistical evaluation referenced above, and includes a compilation of the operational data used to support the derivation of administrative values.

Additionally, as discussed previously and at the April 10, 1997 teleconference, PP&L will submit a change to its ITS submittal, currently under review by the NRC, to describe that the administrative values established for the sensor response times for the four specific functions in question were derived from operational data. The bases clarification will also indicate that this approach was taken due to the fact that the necessary "design" data from the manufacturer was not available.

Topic No. 3 -- PP&L's "Response" to Implementation Requirements Delineated in the NRC Safety Evaluation Report (SER)

As described in Reference No. 1, the NRC approved (Reference No. 3) PP&L's relocation of response time tables from the Technical Specifications to the FSAR in accordance with Generic Letter 93-08 (Reference No. 4), concluding that the provisions of 10 CFR 50.59 provide an acceptable means to control changes to response times in lieu of a license amendment.

Subsequent to the relocation of response time tables from the Technical Specifications, PP&L applied the provisions of 10 CFR 50.59 to eliminate selected instrument and relay response time testing from the FSAR in accordance with guidelines contained within the BWROG Licensing Topical Report (LTR) (Reference No. 5) and the implementation requirements delineated in the NRC SER for the LTR. These NRC implementation requirements actually consist of statements to be made by licensees within license amendment requests to modify Technical Specification response time tables. However, due to the fact that PP&L relocated the response time testing tables to the FSAR, and thus was able to make changes to the tables under 10 CFR 50.59, such a license amendment request (including implementation requirement statements) was not necessary.

In response to a request from the staff on April 10, 1997, PP&L's actions taken in response to each of the statements listed in the SER are described below. It should be noted that these actions were executed as part of PP&L's implementation of the LTR.

The SER states "... licensees must state that they are following the recommendations from EPRI NP-7243 'Investigation of Response Time Testing Requirements' and therefore are requiring 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, and"

*PP&L Actions: Training has been provided to appropriate Engineering personnel and Instrumentation & Control (I&C) personnel to assure familiarity with this requirement. Appropriate plant modification and I&C procedures were revised to include this requirement.*

- (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 lines."

*PP&L Actions: Training has been provided to appropriate Engineering personnel and Instrumentation & Control (I&C) personnel to assure familiarity with this requirement. Appropriate plant Modification and I&C procedures were revised to include this requirement.*

The SER further states that licensee requests must address the items listed below:

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

*PP&L Actions: Existing procedures were determined to be adequate for those instruments with an internal indicator. For blind switches (Static O Ring, Barksdale), a post-calibration functional response time test has been added to the calibration procedures. This test provides a fast ramp signal to the instrument at plus-or-minus 10 percent of the setpoint. This is done as part of the calibration on an 18-month basis (former frequency of response time testing).*

- (b) "That provisions have been made to ensure that operators and technicians 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."

*PP&L Actions: Training has been provided to Operations and I&C personnel to assure familiarity with this requirement. A statement requiring that technicians monitor for response time degradation during the performance of calibrations and functional tests has been added to the applicable test procedures as a standard prerequisite.*

- (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 the units."

*PP&L Actions: Functional tests and calibrations were reviewed and determined to be performed in a manner that allows simultaneous monitoring of both the input and output response of the units.*

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

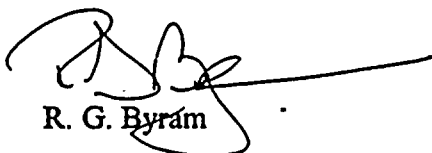
*PP&L Actions: None. There are no Rosemount transmitters in any of the response time tested loops.*

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

*PP&L Actions: A review of EPRI report NP-7423, "Investigation of Response Time Testing Requirements," and calls to various vendors ensured that the above statement was performed. No manufacturer of the instruments for these applications recommends periodic response time testing.*

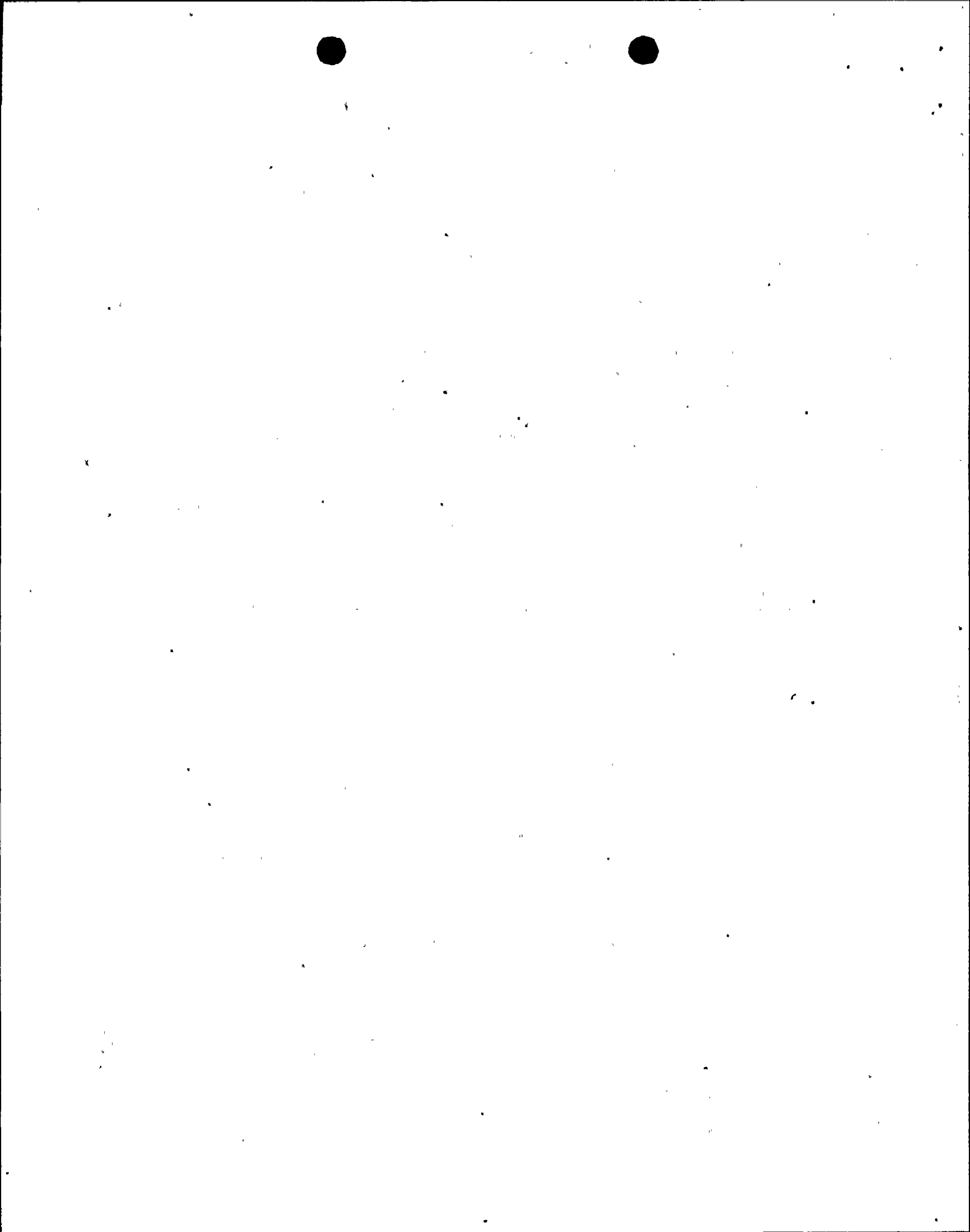
If you have any additional questions, please contact Ms. K.R. Leone at (610) 774-4023.

Very truly yours,



R. G. Byram

Attachment





copy: NRC Region I  
Mr. K. Jenison, NRC Sr. Resident Inspector  
Mr. C. Poslusny, NRC Sr. Project Manager



**ATTACHMENT 1 TO PLA-4608**

**PP&L Calculation No. EC-058-1011**

**Sensor Response Time Values for  
Select RPS and MSIV Isolation Functions**