Entergy

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July 23, 2003
BVY 03-67

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

Reference:
a) Letter, VY to USNRC, "Technical Specification Proposed Change No. 260, Intermediate Range Monitor Surveillance Test Frequencies," BVY 03-49, dated May 21, 2003.
b) Letter, VY to USNRC, "Technical Specification Proposed Change No. 257, ARTS/MELLLA Additional Information in Response to RAI No.9," BVY 03-64, dated July 21, 2003.

Subject: **Vermont Yankee Nuclear Power Station**
License No. DPR-28 (Docket No. 50-271)
Technical Specification Proposed Change No. 260
Intermediate Range Monitor Surveillance Test Frequencies -
Supplemental Information

Per discussion with your staff we are providing additional information that was requested to assist in the review of our request for a License Amendment. This supplemental information does not affect or alter the scope or conclusion of no significant hazards determined in our original submittal.

Attachment 1 to this letter is a copy of VYC-2236, "Drift Calculation for Intermediate Range Monitors." This calculation is submitted in support of this licensing action and it is not Vermont Yankee's intention to maintain the docket current with regard to future revisions to this analysis.

Additionally, as part of Reference (b), Vermont Yankee submitted instrument setpoint methodology documentation. This methodology documentation is also applicable to this calculation and can be considered as reference information to support your review of this submittal as well.

If you have any questions concerning this submittal or desire additional information, please contact Ronda Daflucas at (802) 258-4232.

Sincerely,

Jay K. Thayer
Site Vice President

A001

STATE OF VERMONT)
)ss
WINDHAM COUNTY)

Then personally appeared before me, Jay K. Thayer, who, being duly sworn, did state that he is Site Vice President of the Vermont Yankee Nuclear Power Station, that he is duly authorized to execute and file the foregoing document, and that the statements therein are true to the best of his knowledge and belief.

SALLY A. SANDSTRUM NOTARY PUBLIC WINDHAM COUNTY, VERMONT

Sally A. Sandstrum

Sally A. Sandstrum, Notary Public
My Commission Expires February 10, 2007

Attachment

cc: USNRC Region 1 Administrator
USNRC Project Manager – VYNPS
USNRC Resident Inspector – VYNPS
Vermont Department of Public Service

Docket No. 50-271
BVY 03-67

Attachment 1

Vermont Yankee Nuclear Power Station

Technical Specification Proposed Change No. 260

Supplemental Information

VYC-2236, Drift Calculation for Intermediate Range Monitors

VY CALCULATION TITLE PAGE

VYC-2236	0	N/A	N/A
VY Calculation Number	Revision Number	Vendor Calculation Number	Revision Number

Title: Drift Calculation for Intermediate Range Monitors

QA Status: ☒ SC ☐ NNS ☐ OQA Operating Cycle Number* N/A

* The Operating Cycle Number should only be entered here if the results of the calculation only apply during a specific operating cycle otherwise enter "N/A".

Calculation Supports A Design Change/Specification? ☐ Yes ☒ No N/A (VYDC/MM/TM/Spec No.)

Implementation Required? ☐ Yes ☒ No Calculation Done as a Study Only? ☐ Yes ☒ No

Safety Evaluation Number: N/A

Superseded Calculation Number, Title and Revision: None

For Revisions: List CCNs, IIJs, or SAs incorporated/superseded by this revision:

Computer Code(s): JG 9/18/02

Are there open items in this calculation/revision? ☒ Yes ☒ No

Review and Approval: (Print and Sign Name)

Preparer: Kirk R. Melson / Jerry D. Voss Kirk R. Melson Jerry D. Voss Date: 6/26/02

Interdiscipline Reviewer(s): Date:

Independent Reviewers(s): Brian F. Davidson Date: 6/24/02

Approved: JKq / R.T. Vibert Date: 9/17/02

Accepted (only for AP 0017 calculations performed by vendors) ☒ N/A

Date:

Final Turnover to DCC (Section 2):

1) All open items, if any, have been closed.

2) Implementation Confirmation (Section 2.3.4) Total No. Pages in Package (including all attachments)

☒ Calculation accurately reflects existing plant configuration, (confirmation method indicated below)

☐ Walkdown ☐ As-Built Input review ☒ Discussion with JOSEPH GAROZZO (Print Name)

OR

☐ N/A, calculation does not reflect existing plant configuration

3) Resolution of documents identified in the Design Output Documents Section of VYAPF 0017.07 has been initiated as required (Section 2.3.6, 2.3.7)

JOSEPH GAROZZO / Joseph Garozzo / 9/16/02

Printed Name Signature Date

Page 1 of 27 Pages (Body of Calculation)

Page 1 of 98 Pages (Total Including Attachments)

VY CALCULATION DATABASE INPUT FORM

Place this form in the calculation package immediately following the Title page or CCN form.

VYC-2236	0	N/A	N/A
VY Calculation/CCN Number	Revision Number	Vendor Calculation Number	Revision Number

Vendor Name: N/A PO Number: N/A
Originating Department: VY Design Engineering (E/I&C)
Critical References Impacted: ☒ UFSAR ☐ DBD ☐ Reload. "Check" the appropriate box if any critical document is identified in the tables below.
EMPAC Asset/Equipment ID Number(s): 7-41A, B, C, D, E, F
EMPAC Asset/System ID Number(s): Reactor Protection System, Neutron Monitoring / NM / C51
Keywords: Intermediate Range, Neutron Monitoring, SCRAM, Drift, Setpoint, Calculation
For Revision/CCN only: Are deletions to General References, Design Input Documents or Design Output Documents required? ☐ Yes† ☒ No

Design Input Documents and General References - The following documents provide design input or supporting information to this calculation. (Refer to Appendix A, sections 3.2.7 and section 4)

* Reference #	** DOC #	REV #	***Document Title (including Date, if applicable)	Significant Difference Review ††	**** Affected Program	Critical Reference (✓)
GEN01	AP-0017	8, LPC #2	Vermont Yankee Administrative Procedure, Calculations and Analyses			
GEN02		1	Vermont Yankee Instrument Drift Analysis Design Guide (Appendix E to Vermont Yankee Setpoint Program Manual)			
GEN03		1	Vermont Yankee Instrument Uncertainty and Setpoints Design Guide (Appendix D to Vermont Yankee Setpoint Program Manual)			
GEN04	EPRI TR-103335	1	Guidelines For Instrument Calibration Extension/Reduction Programs			
GEN05	ANSI N15.15-1974	0	Assessment of the Assumption of Normality (Employing Individual Observed Values).			
GEN06			Microsoft Excel Version 97SR-2 and Microsoft Excel 2000.			
GEN07			EMPAC, Maintenance Planning and Control System			
GEN08	VYC-1599	0	Drift Calculation For Fenwal Temp Sw Models 01-170020-090 & 01-170230-090 (Used as Verification and Validation for use of Microsoft Excel ONLY)			

VY CALCULATION DATABASE INPUT FORM (Continued)

* Reference #	** DOC #	REV #	***Document Title (including Date, if applicable)	Significant Difference Review ††	**** Affected Program	Critical Reference (✓)
GEN09			Correspondence from USNRC to Mr. R. W. James, EPRI, Dated December 1, 1997, "Status Report on the Staff Review of EPRI Technical Report TR-103335, "Guidelines for Instrument Calibration Extension / Reduction Programs," Dated March 1994"			
D-IN01	OP-4301	17, LPC #1	Vermont Yankee Operating Procedure, Intermediate Range Monitor Functional / Calibration			
D-IN02		17	Vermont Yankee Final Safety Analysis Report Section 7.5.5 and Table 7.5.2			✓
D-IN03	VYEM-0213	0	Mean Square Voltage Wide Range Monitor, Dated 1/27/92			

Design Output Documents - This calculation provides output to the following documents. (Refer to Appendix A, section 5)

* Reference #	** DOC #	REV #	Document Title (including Date, if applicable)	**** Affected Program	†††Critical Reference (✓)
D-OUT01	VYC-692A	0	Calculation, Intermediate Range Neutron Monitoring Trip Loops		

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Attachment 2.	EMPAC IRM Maintenance Rule Performance History Review	[3 Pgs]
Attachment 3.	IRM Trip Circuit Raw Data	[11 Pgs]
Attachment 4.	IRM Trip Circuit Statistics	[2 Pgs]
Attachment 5.	IRM Trip Circuit t-Test Results	[1 Pgs]
Attachment 6.	IRM Trip Circuit Raw Data for Extended Intervals	[7 Pgs]
Attachment 7.	IRM Trip Circuit Extended Interval Statistics and Outliers	[3 Pgs]
Attachment 8.	IRM Trip Circuit Charts and Summary	[9 Pgs]
Attachment 9.	IRM Zero Circuit Raw Data	[11 Pgs]
Attachment 10.	IRM Zero Circuit Statistics	[1 Pgs]
Attachment 11.	IRM Zero Circuit t-Test Results	[1 Pgs]
Attachment 12.	IRM Zero Circuit Raw Data for Extended Intervals	[3 Pgs]
Attachment 13.	IRM Zero Circuit Extended Interval Statistics and Outliers	[3 Pgs]
Attachment 14.	IRM Zero Circuit Charts and Summary	[9 Pgs]
Attachment 15.	AP-0017 Forms (VYAPF 0017.04, 05, and 06)	[4 Pgs]

HISTORY OF REVISIONS

Rev. No.	Approval Date	Reason & Description of Change
0	6/26/2002	Initial Issue.

1. CALCULATION OBJECTIVES

This calculation documents the drift analysis performed on the Intermediate Range Neutron Monitors (IRM) installed at Vermont Yankee. This calculation has been developed in support of the Vermont Yankee Setpoint Program with the following major objectives.

- Determine the drift characteristics for the IRMs listed in Table 1 (IRM Equipment Summary).
- Document the analyses performed on the components in accordance with the "Vermont Yankee Instrument Drift Analysis Design Guide." [GEN02]
- Provide the standard deviation, average, variance, 95%/95% Tolerance Interval Factors (TIF) for the IRMs.
- Evaluate the data for normality, time dependency, mean bias and provide the 95%/95% Analyzed Drift Term (DA) for the IRMs for a desired nominal surveillance interval of 24 months.

1.1. Methods of Meeting Objectives

As required by AP-0017 the methods for verifying how an objective is met is required. All of the above objectives are met through performance of this calculation and the results of each objective are captured in Section 5, "Summary of Results / Conclusions". [GEN01]

1.2. Systems & Components

This calculation applies to the Intermediate Range Monitors installed at Vermont Yankee. The specific components addressed are listed below in the equipment summary table.

Table 1 – IRM Equipment Summary

Tag No.	Sys	Description	S/C	Model No	Range	Stpt	Tolerance	Proc
7-41A	NM	IRM A	SCE	194X672G8	0-125 Units	Note 1	± 0.75 Units	OP-4301
7-41B	NM	IRM B	SCE	194X672G8	0-125 Units	Note 1	± 0.75 Units	OP-4301
7-41C	NM	IRM C	SCE	194X672G8	0-125 Units	Note 1	± 0.75 Units	OP-4301
7-41D	NM	IRM D	SCE	194X672G8	0-125 Units	Note 1	± 0.75 Units	OP-4301
7-41E	NM	IRM E	SCE	194X672G8	0-125 Units	Note 1	± 0.75 Units	OP-4301
7-41F	NM	IRM F	SCE	194X672G8	0-125 Units	Note 1	± 0.75 Units	OP-4301

Note 1: Three Setpoints Associated with Each IRM:

Downscale Rod Block Setting	=	9.25 Units (9.25 / 125)
Hi Rod Block Setting	=	103.75 Units (103.75 / 125)
HI HI SCRAM Setting	=	115.75 Units (115.75 / 125)

Note 2: The drift of the IRMs is measured from analysis of the trip circuits and the Op Amp zero circuits for DC amplifier AR-15 and feedback module Z-14.

The IRM mean square voltage, wide range monitor (MSV-WRM) receives input signals from a fission counter (ion chamber) detector. A voltage preamplifier, containing two frequency sensitive amplifier sections, amplifies the detector output. The voltage preamplifier signal is then applied to the amplifier and attenuator module of the Intermediate Range Monitor, which measures the mean square value of input signal variations in one of two discrete frequency bandwidths. The output neutron flux levels are displayed on local meters (CRP 9-12) and front panel meters and recorders located on CRP 9-5. Neutron flux levels that fall outside of particular levels cause trip signals to be supplied to the process computer, local (CRP 9-12) and remote indicator lamps, alarm annunciators, the Reactor Protection System (RPS) and the Reactor Manual Control system (RMCS). The safety trips generated by these monitors are required whenever the Reactor Mode Selector switch is not in the RUN position. If in the RUN mode and the APRMs are on scale, the IRM safety trips are bypassed. IRM "D" is tied to the computer via M072. [D-IN01]

During a controlled shutdown the Range Correlation Adjustment (R44) in the preamplifier and the Channel Gain Adjustment (R19) in the Amplifier and Attenuator are performed in conjunction with Reactor Engineering procedure OP 2445. Per calculation VYC-692A, consideration of drift for these components is not necessary. [D-IN01]

The calibration of each IRM involves the following adjustments at the IRM drawer: [D-IN01]

1. Adjustment of the zero circuit of low level DC amplifier AR-15
2. Adjustment of the zero circuit of feedback module Z-14
3. Calibration of the local meter
4. Adjustment of the three trip circuits

Drift of the local meter is not of concern with regard to the trip settings, as it is only used as Measurement & Test Equipment (M&TE) in the calibration process, and is calibrated prior to the adjustment of the trip circuits. [D-IN01]

Per Drawing 729E384 within GEK-27723, Figure 3-1 of GEK-852B, and Drawing 107C4818 of GEK-914C (all contained within D-IN03), the two zero adjustments directly affect the zero of the process signal as it is passed on to the trip circuits. Per D-IN01, the calibration is performed such that the Low Level DC Amplifier AR-15 is isolated from the rest of the circuit, with a zero input. The output of AR-15 is monitored while adjusting the zero setting to ensure a 0 Vdc output, ±10mVdc. After adjustment of AR-15, the amplifier is connected in series with the feedback module, Z-14, which is isolated from the signal path, except for the low level +15 Vdc and −15 Vdc signals. Once again, the output of AR-15 is monitored to ensure a 0 Vdc output, ±10mVdc, as the zero adjustment of the Z-14 feedback module is manipulated. Effectively, the zero adjustment circuits of the amplifier and feedback module compensate for any electronic drift associated with the low level amplification and power supply circuits that would directly affect the signal input in the form of a bias. The total drift of the IRM for a given trip function is therefore determined from a statistical combination of the drift of the AR-15 zero circuit, the drift of the Z-14 zero circuit, and the drift of the trip circuit. [D-IN01, D-IN03]

1.3. Instrument Loop Function (Abbreviated)

1.3.1. Normal Operations

The Intermediate Range Monitor Subsystem (IRMS) provides a relative measure of power from the upper portion of the Source Range Monitors' (SRMs) range to the lower portion of the Average Power Range Monitors' (APRMs) range. There are six IRM channels of instrumentation, each of which includes one detector that can be physically positioned in the core by remote control. The detectors are inserted in the core for a reactor startup and are withdrawn after the reactor mode selector switch is turned to "RUN". [D-IN02]

Any IRM initiates the following signals to the Reactor Manual Control System to effect a rod withdrawal block: 1) upscale alarm, 2) downscale alarm (except on range 1), 3) inoperative alarm, and 4) IRM detector not fully inserted in the core. All of these functions are bypassed when the reactor switch is in "RUN" and the associated APRMs and RBM are not downscale. [D-IN02]

In addition to rod block trips, the IRMS can initiate a reactor scram on high level or inoperative condition, via the Reactor Protection System, preventing fuel damage while operating in the intermediate range. The IRMS is operational when the reactor is not in the "Run Mode". Typically it is used during plant startup but can be used in both a controlled shutdown and during refueling. These scram functions are bypassed when the reactor mode switch is in "RUN" and the associated APRMs are not downscale. [D-IN02]

1.4. Governing Procedures And Programs

1.4.1. Vermont Yankee Engineering Procedure, AP-0017, Rev. 8, Calculations and Analyses. [GEN01]

1.4.2. Vermont Yankee Instrument Drift Analysis Design Guide, Rev. 1. [GEN02]

1.4.3. Vermont Yankee Instrument Uncertainty and Setpoints Design Guide, Rev. 1. [GEN03]

2. METHOD OF SOLUTION

This calculation has been prepared in accordance with the Governing Procedures and Programs listed in step 1.4. Standard methods employed in this calculation are explained in the "Vermont Yankee Instrument Drift Analysis Design Guide", an overview of the methodology is explained below. The computations and analysis are split between two efforts as explained in Section 1.2 above, drift analysis for the trip circuits and drift analysis for the zero circuits. [GEN02]

2.1. Data Entry and Determination of Drift Values

2.1.1. Data Entry and Drift Determination for IRM Trip Circuits

2.1.1.1. Calibration data was collected from the applicable Surveillance Test for the components listed in Table 1 (IRM Equipment Summary).

2.1.1.2. The data was then entered into a Microsoft Excel Spreadsheet, noting any special circumstances found with the data (e.g. As Found out of tolerance, associated work orders, etc.). As Found and As Left settings were entered for the three setpoints in the calibration of the trip circuitry (Sections A.9, A.10, B.9 and B.10 of D-IN01). [Att. 3]

2.1.1.3. The drift (expressed in percent of Span) was determined by the As Found Versus As Left Calibration Data Analysis outlined by the "Vermont Yankee Instrument Drift Analysis Design Guide" and as shown in the example provided in Figure 1. [GEN02 & Att. 1]

2.1.1.4. The data was sorted descending by date for each component, with the most current date at the head of the list. [Att. 3]

Figure 1 – Sample Spreadsheet Format

OP 4310: SCRAM DISCHARGE INSTRUMENT VOLUME HIGH WATER FUNCT/CAL
DRIFT ANALYSIS LT-3-231A(M) SPAN = 16 mADC

Date	Data Status	Interval (Days)	Initial Data TRIP	Raw Drift Data TRIP
	Required Trip 50.0 "H20 (=16.70 mADC)			
2/22/96	As Found		*16.68*	
	As Left	94	*16.68*	0.000%
11/20/95	As Found		*16.68*	
	As Left	25	*16.68*	0.000%
10/26/95	As Found		*16.68*	
	As Left	64	*16.68*	0.000%
8/23/95	As Found		*16.68*	
	As Left		*16.68*	

Value represents the number of days between 2/22/96 and 11/20/95.

Value represents the 2/22/96 As Found minus the 11/20/95 As Left divided by the device span.

Note: The italicized areas show where data from surveillance tests are inputted on the spreadsheet. Formats may vary.

2.1.2. Data Entry and Drift Determination for IRM Zero Circuits

2.1.2.1. Calibration data was collected from the applicable Surveillance Test for the components listed in Table 1 (IRM Equipment Summary).

2.1.2.2. The data was then entered into a Microsoft Excel Spreadsheet, noting any special circumstances found with the data (e.g. As Found out of tolerance, associated work orders, etc.). As Found and As Left settings were entered for the two adjustments in the calibration of the zero circuitry (Sections A.7 and B.7 of D-IN01). [Att. 9]

2.1.2.3. The drift (expressed in percent of Span) was determined by the As Found Versus As Left Calibration Data Analysis outlined by the "Vermont Yankee Instrument Drift Analysis Design Guide" and as shown in the example provided in Figure 1 above. [GEN02 & Att. 1]

2.1.2.4. The data was sorted descending by date for each component, with the most current date at the head of the list. [Att. 9]

2.2. Preparing the Data for Analysis

2.2.1. Data Preparation for IRM Trip Circuits

2.2.1.1. For each of the three trip functions, the drift data was copied to a new worksheet and the raw as found and as left values were removed, leaving only the dates, time intervals and the raw drift data.

2.2.1.2. No data was identified to be non-representative due to equipment failure, calibration changes, setpoint changes, etc. Therefore, the original data set was entered. (Shown on Attachment 3). [Att. 3]

2.2.2. Data Preparation for IRM Zero Circuits

2.2.2.1. For each of the two zero circuit adjustments, the drift data was copied to a new worksheet and the raw as found and as left values were removed, leaving only the dates, time intervals and the raw drift data.

2.2.2.2. Any data identified to be non-representative due to equipment failure, calibration changes, setpoint changes, etc. was removed from the data set. (Shown on Attachment 9). [Att. 9]

2.3. Determination of Statistics for the Drift Data

For each of the three trip circuit functions and both zero circuit adjustments, the following statistical values were determined for the individual data sets using Microsoft Excel. [See Att. 4 for trip circuits and Att. 10 for zero circuits.] In addition, the statistical summary for the data from all three trip data sets combined is included in Attachment 4, and the statistical summary for both zero circuit data sets combined is included in Attachment 10. [Att. 4 & 10]

2.3.1. The number of samples using the "COUNT" function. Example cell format **=COUNT(C2:C133)**; The Count function returns the number of all populated cells within the range of cells C2 through C133. [Att. 4 &10]

2.3.2. The average using the "AVERAGE" function. Example cell format **=AVERAGE(C2:C133)**; The Average function returns the average of the data contained within the range of cells C2 through C133. [Att. 4 &10]

2.3.3. The standard deviation using the "STDEV" function. Example cell format =STDEV(C2:C133); The Standard Deviation function returns the measure of how widely values are dispersed from the mean of the data contained within the range of cells C2 through C133. Formula used by Microsoft Excel to determine the standard deviation: [Att. 4 &10]

$$s = \sqrt{\frac{n\sum x^2 - \left(\sum x\right)^2}{n(n-1)}}$$

where; [GEN02 & GEN06]

x - Sample data values (x_1, x_2, x_3, ...)
s - Standard deviation of all sample data points
n - Total number of data points

2.3.4. The variance using the "VAR" function. Example cell format =VAR(C2:C133); The Variance function returns the measure of how widely values are dispersed from the mean of the data contained within the range of cells C2 through C133. Formula used by Microsoft Excel to determine the variance: [Att. 4 & 10]

$$s^2 = \frac{n\sum x^2 - \left(\sum x\right)^2}{n(n-1)}$$

where; [GEN02 & GEN06]

x - Sample data values (x1, x2, x3, ...)
s^2 - Variance of the sample population.
n - Total number of data points

2.3.5. The kurtosis using the "KURT" function. Example cell format =KURT(C2:C133); The Kurtosis function returns the relative peakedness or flatness of the distribution within the range of cells C2 through C133. Formula used by Microsoft Excel to determine the kurtosis: [Att. 3 & 9]

$$KURT = \left\{\frac{n(n+1)}{(n-1)(n-2)(n-3)}\sum\left(\frac{x_i - \bar{x}}{s}\right)^4\right\} - \frac{3(n-1)^2}{(n-2)(n-3)}$$

where ; [GEN02 & GEN06]

x - Sample data values (x1, x2, x3, ...)
n - Total number of data points.
s - Sample Standard Deviation.

2.3.6. The skewness using the "SKEW" function. Example cell format =SKEW(C2:C133); The Skewness function returns the degree of symmetry around the mean of the cells contained within the range of cells C2 through C133. Formula used by Microsoft Excel to determine the skewness: [Att. 3 & 9]

$$SKEW = \frac{n(n+1)}{(n-1)(n-2)}\sum\left(\frac{x_i - \bar{x}}{s}\right)^3$$

where; [GEN02 & GEN06]

x - Sample data values (x1, x2, x3, ...)
n - Total number of data points.
s - Sample Standard Deviation.

2.3.7. The maximum using the "MAX" function. Example cell format =MAX(C2:C133); The Maximum function returns the largest value of the cells contained within the range of cells C2 through C133. [Att. 3 & 9]

2.3.8. The minimum using the "MIN" function. Example cell format =MIN(C2:C133); The Minimum function returns the smallest value of the cells contained within the range of cells C2 through C133. [Att. 3 & 9]

2.3.9. Using the number of samples determined in Step 2.3.1, the 95%/95% TIF was obtained from Table 2 (Tolerance Interval Factors – extracted from the Vermont Yankee Instrument Drift Analysis Design Guide) using the more conservative value with no interpolation of the table. [GEN02]

Table 2 - Tolerance Interval Factors

Tolerance Level = 95%/95%			
Sample Size	TIF Factor	Sample Size	TIF Factor
2	37.674	50	2.379
3	9.916	55	2.354
4	6.37	60	2.333
5	5.079	65	2.315
6	4.414	70	2.299
7	4.007	75	2.285
8	3.732	80	2.272
9	3.532	85	2.261
10	3.379	90	2.251
11	3.259	95	2.241
12	3.162	100	2.233
13	3.081	110	2.218
14	3.012	120	2.205
15	2.954	130	2.194
16	2.903	140	2.184
17	2.858	150	2.175
18	2.819	160	2.167
19	2.784	170	2.16
20	2.752	180	2.154
21	2.723	190	2.148
22	2.697	200	2.143
23	2.673	250	2.121
24	2.651	300	2.106
25	2.631	400	2.084
26	2.612	500	2.07
27	2.595	600	2.06
30	2.549	700	2.052
35	2.49	800	2.046
40	2.445	900	2.04
45	2.408	1000	2.036

2.3.10. The TIF was then multiplied by the standard deviation determined in Step 2.3.3 to determine the tolerance interval corrected drift value. [Att. 3 & 9]

2.3.11. The tolerance interval corrected drift values are the random portion of the Analyzed Drift for the zero circuits and the trip circuits. These values are computed within Attachments 7 and 13 and are shown again in Table 11. [Table 11 & Att. 7 & 13]

2.4. Pooling the Drift Data

Note: Refer to the "Vermont Yankee Instrument Drift Analysis Design Guide" for methodology used in this section. [GEN02]

2.4.1. Pooling of Drift Data for IRM Trip Circuits

2.4.1.1. The As Found and As Left data from the trip circuitry is very similar between applications. The trip circuits all act upon the same incoming 0-10 Vdc signal. One function trips upon a decreasing signal, and the other two trip on increasing signals. Although the trip settings are at different points on the scale, it is postulated that the three trip circuits will perform very similarly. Data from all three settings were evaluated to determine the data's suitability for combining. [D-IN03]

2.4.1.2. A t-Test assuming unequal variances was performed on the three potential groupings using the following equation in Microsoft Excel: [GEN02]

$$t' = \frac{x_1 - x_2 - \Delta_0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

where; [GEN02]

t' - test statistic
n - Total number of data points.
x - Mean of the samples.
s^2 - Pooled variance
Δ_0 - Hypothesized mean difference.

2.4.1.2.1. The test performs a two-sample student's t-test that assumes that the variances of both ranges of data are unequal and is referred to as a heteroscedastic t-test. This t-test is used to determine whether two sample means are equal and when the groups under study are distinct. [GEN02]

2.4.1.2.2. If the probability for the two tailed distribution {P(T<=t)} is greater than or equal to the test statistic (t) then the test passes and the data may be considered for combination. This was the case for all data comparisons between the trip functions, as shown in Attachment 5. [GEN02 & Att. 5]

2.4.1.2.3. If the probability for the two tailed distribution {P(T<=t)} is less than the test statistic (t) then the test fails and the data may not be considered for combination. [GEN02]

2.4.1.3. Based on identical circuitry, location and the t-Test results performed in Step 2.4.1.2, the pooling tests reveal that all of the data from the trip circuitry can be combined for drift analysis. No sub-groups were formed. All data was combined for analysis, and all of the statistics for the entire data set was determined, in accordance with Section 2.3 above. The statistical summary for the combined data set is shown in Attachment 4. [Att. 4 & 5]

2.4.2. Pooling of Drift Data for IRM Zero Circuits

2.4.2.1. The As Found and As Left data from the zero circuitry is very similar between applications. The zero adjustment for both the DC Amplifier AR-15 and feedback circuitry Z-14 compensate for small scale electronic drift from low level amplification and power supplies. Both adjustments are made while monitoring the output of the AR-15 circuit, which is a 0-10 Vdc signal. Both adjustments are made to a ±10 mVdc tolerance. Data from both adjustments were evaluated to determine the data's suitability for combining. [D-IN03]

2.4.2.2. A t-Test assuming unequal variances was performed on the three potential groupings using the following equation in Microsoft Excel: [GEN02]

$$t' = \frac{\bar{x}_1 - \bar{x}_2 - \Delta_0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

where; [GEN02]

t' - test statistic
n - Total number of data points.
x - Mean of the samples.
s^2 - Pooled variance
Δ_0 - Hypothesized mean difference.

2.4.2.2.1. The test performs a two-sample student's t-test that assumes that the variances of both ranges of data are unequal and is referred to as a heteroscedastic t-test. This t-test is used to determine whether two sample means are equal and when the groups under study are distinct. [GEN02]

2.4.2.2.2. If the probability for the two tailed distribution {P(T<=t)} is greater than or equal to the test statistic (t) then the test passes and the data may be considered for combination. This was the case for the comparison between the zero circuit adjustments, as shown in Attachment 11. [GEN02 & Att. 11]

2.4.2.2.3. If the probability for the two tailed distribution {P(T<=t)} is less than the test statistic (t) then the test fails and the data may not be considered for combination. [GEN02]

2.4.2.3. Based on similar circuitry, identical manufacturer and location, and the t-Test results performed in Step 2.4.2.2, the data from the zero circuitry can be combined for drift analysis. No sub-groups were formed. All data was combined for analysis, and all of the statistics for the entire data set was determined, in accordance with Section 2.3 above. The statistical summary for the combined data set is shown in Attachment 10. [Att. 10]

2.5. Instrument Resetting Evaluation

Note: For a description of the methodology used for this section, see Section 3.10.4 of GEN02.

2.5.1. When initially reviewing the As Found / As Left data for the drift analysis, several facts became evident. Except for one setpoint change that occurred in 2001, the IRM trip circuits virtually never required adjustment during the analysis period. The zero circuits were adjusted slightly more often, but also generally had significantly long periods between adjustments. Since the objective of this study is to determine drift values for the IRMs up to a 30-month interval, an instrument resetting evaluation was performed. [Att. 3 & 9]

2.5.2. Per the second paragraph of Section 3.10.4 of GEN02, the Instrument Resetting Evaluation may be performed only if the devices in the sample pool are shown to be stable, not requiring adjustment (i.e. less than 5% of the data shows that adjustments were made). This requirement is a guideline, not a hard fast rule, and is most applicable for cases where a formal drift analysis is not performed, but merely an analysis to show that the devices do not require resetting, and therefore have no drift. For the case of the IRM trip circuitry, less than 1% of the calibrations required an adjustment. For the zero circuitry, less than 8.8% of the calibrations required an adjustment. Although this value is above the 5% guideline as stated in GEN02, it is considered acceptable to use this approach for the following reasons. [Att. 3 & 9]

A. The tolerances for the zero circuitry are much tighter than for the trip units (0.1% Span vs. 0.6% Span). This shows that a violation of the required tolerance for the zero circuitry will have a relatively minor effect on the accuracy of the instrumentation.
B. An 8.8% occurrence of an instrument requiring adjustment is still considered to be small.
C. The drift of the IRM over an extended interval, up to 30 months, is desired. There is significant added value in observing actual drift performance of the IRMs over this extended interval, which is only possible with this type of evaluation.
D. Per GEN09, the NRC expressed no concerns about the use of an Instrument Resetting Evaluation, as long as the data does not overlap, or as long as longer interval data is not used in conjunction with the shorter interval data used to construct the longer interval data. "For a target surveillance interval constructed of shorter intervals where instrument reset did not occur, the longer intervals are statistically dependent upon the shorter intervals; hence, either the constructed longer interval data or the shorter-interval data should be used, but not both. In a constructed interval, $drift = as\text{-}left_{(0)} - as\text{-}found_{(ssf)}$; the intermediate values are not used." [GEN09]

2.5.3. Observing the equations within Section 3.10.4 of GEN02, the equations can be simplified, thus equating drift to the As Found value at a chosen date minus the As Left value at the previous chosen date for analysis. This agrees with the statement from the NRC in Section 2.5.2, Item D above. [GEN02]

2.5.4. The IRM trip circuit data and the IRM zero circuit data were used to construct longer interval drift data for each. The goal of this effort was to produce a significant amount of drift information for the IRMs at a period of 24-30 months. Therefore, the following approach was taken to constructing the drift data.

A. Where instrument reset occurred within a 30 month interval from the previous reset, any and all intermediate data was eliminated, and the drift for that reset period was used.

B. Where instrument reset did not occur over a significantly longer period than 30 months, appropriate intermediate data was selected to maximize the number of data values measured at 24-30 months. The chosen intermediate calibrations were treated as reset points in the drift equations. Therefore, the drift from the previous period was stopped there, and the drift for the subsequent period started there. This prevents overlap and dependency of the drift data.

2.5.5. The drift data for the extended intervals was compiled for both cases, and is documented as raw data in Attachment 6 for the trip circuits and Attachment 12 for the zero circuits. [Att. 6 & 12]

2.5.6. Statistical analysis was performed on the raw drift data from Attachments 6 and 12, as outlined in Section 2.3 above. The summaries of the statistical information from the extended interval drift data are shown in Attachment 7 for the trip circuits and Attachment 13 for the zero circuits. [Att. 7 & 13]

2.6. Outlier Description

An outlier is a data point significantly different in value from the rest of the sample. The presence of an outlier or multiple outliers in the sample of component or group data may result in the calculation of a larger than expected sample standard deviation and tolerance interval. Calibration data can contain outliers for several reasons that permit correction of the data or rejection of these data points from the sample. Examples include: [GEN02]

- *Data Transcription Errors* - Calibration data can be recorded incorrectly either on the original calibration data sheet or in the spreadsheet program used to analyze the data.
- *Calibration Errors* - Improper setting of a device at the time of calibration. Would indicate larger than normal drift during the next subsequent calibration.
- *Measuring & Test Equipment Errors* - Improperly selected or miscalibrated test equipment could indicate drift when little or no drift was actually present.
- *Scaling or Setpoint Changes* - Changes in scaling or setpoints can appear in the data as a larger than actual drift points unless the change is detected during the data entry or screening process.
- *Failed Instruments* - Calibrations are occasionally performed to verify proper operation due to erratic indications, spurious alarms, etc. These calibrations may be indicative of component failure and not drift, which would introduce errors that are not representative of the device performance during routine conditions.
- *Design or Application Deficiencies* - An analysis of calibration data may indicate a particular component that always tends to drift significantly more than all other similar components installed in the plant. In this case, the component may need an evaluation for the possibility of a design, application, or installation problem. Including this particular component in the same population as the other similar components may skew the drift analysis results. [GEN02]

2.6.1. Outliers were determined and evaluated in accordance with the "Vermont Yankee Instrument Drift Analysis Design Guide." [GEN02 & Att. 7 & 13]

2.6.2. Cell Formula for outlier determination = If {Absolute Value (Raw Trip Value - Group Average) ÷ Group Standard Deviation < Critical Value for T, Then the Raw Trip Value is True}. Example Cell Format =IF(ABS(C2-C$135) / C$136 < 3.28,C2,""). From the above formula it is derived that the Max Pt = {Absolute Value (Group Average) + Absolute Value (Group Standard Deviation x Critical Value for T)}. An Absolute Value of the Raw Trip Data greater than the Max Pt indicates a statistical outlier. The Max Pt was determined for each group (trip and zero circuits) and used in determination of outliers. [Att. 7 & 13]

2.6.3. Critical Values For T in step 2.6.2 were obtained from Table 3 (Critical Value For t-Test extracted from the Vermont Yankee Instrument Drift Analysis Design Guide) based on sample size using the more conservative value with no interpolation of the table. [GEN02]

Table 3 - Critical Values For t-Test

Sample Size	Upper 5% Significance Level	Sample Size	Upper 5% Significance Level	Sample Size	Upper 5% Significance Level
3	1.15	16	2.44	45	2.92
4	1.46	17	2.47	50	2.96
5	1.67	18	2.5	60	3.03
6	1.82	19	2.53	70	3.09
7	1.94	20	2.56	75	3.1
8	2.03	21	2.58	80	3.14
9	2.11	22	2.6	90	3.18
10	2.18	23	2.62	100	3.21
11	2.23	24	2.64	125	3.28
12	2.29	25	2.66	150	3.33
13	2.33	30	2.75	>150	4.00
14	2.37	35	2.82		
15	2.41	40	2.87		

2.6.4. No outliers were detected or expelled from the trip circuit or zero circuit data based on the outlier analysis. [Att. 7 & 13]

2.7. Plotting the Group Drift Data

The drift data from the two groups (trip circuits and zero circuits) are plotted in Attachments 8 and 14. The following is a summary of the charts that are included.

2.7.1. X-Y Scatter Plots were created from the data using the time interval between calibrations versus the outlier-tested drift data for each group. [Att. 8 &14]

2.7.2. X-Y Scatter Plots were created from the absolute value of the outlier-tested drift data verses the time interval between calibrations for each group. [Att. 8 &14]

2.7.3. A regression plot was created from the outlier-tested data for each group. Since a significant quantity of drift data is available at calibration periods of 24-30 months, specific time dependency evaluations are not necessary, and Regression statistics are not included for the plots. [Att. 8 &14]

2.7.4. A regression plot was created from the absolute value of the outlier-tested data for each group. Since a significant quantity of drift data is available at calibration periods of 24-30 months, time dependency evaluations are not necessary, and Regression statistics are not included for the plots. [Att. 8 &14]

2.7.5. Although not specifically necessary, a time dependency plot was created from the tables shown in Section 5.2 for each group. [Att. 8 &14]

2.7.6. A cumulative probability plot was created from the raw outlier tested data by calculating the probability and using the regression tool to plot the probability against the % Drift for each of the groups. [Att. 8 &14]

Formula used to calculate the probability:

$$P_i = \frac{100 \times \left(i - \frac{1}{2}\right)}{n}$$

where;
i - Sample number i.e. 1,2,... [GEN02]
n - Sample size

2.7.7. A normalized probability plot was created from the raw outlier tested data and the calculated probability from step 2.7.6. To create the normalized probability plot the calculated probability is binned into multiples of the standard deviation and the regression tool is used to show the multiple of the standard deviation against the % Drift for each of the groups. [Att. 8 &14]

2.7.8. A histogram was created from the outlier-tested data for each group. [Att. 8 &14]

2.8. D-Prime Testing for Normality

2.8.1. The drift data from the IRM trip circuits consisted of a group of discrete values, because of the fact that an analog local panel meter was used to record the As Found and As Left readings for the trips settings. The readability of the local panel meter limits the data values recorded, and thus does not provide a smooth set of data over which to evaluate normality. Therefore, the D-Prime test is not documented for the IRM trip circuit data. However, the D-Prime test was performed for the zero circuit data, per the requirements of GEN05. [GEN05]

2.8.2. The D-Prime Test calculates a test statistic value for the sample population and compares the calculated value to the values for the D-Prime percentage points of the distribution, which are tabulated in GEN05. The D-Prime Test is two-sided, which effectively means that the calculated D-Prime must be bounded by the two-sided percentage points at the stated level of significance, which in this case is 0.025. For the given sample size, the calculated value of D-Prime must lie within the two values provided in the GEN05 table in order to accept the hypothesis of normality. [GEN05]

2.8.3. The Equations used to perform the D-Prime test are as follows, per GEN02.

1) First calculate the linear combination of the sample group

$$T = \sum \left[\left(i - \frac{n+1}{2} \right) \times x_i \right]$$

[GEN02]

Where;
x_i - An individual sample data point
i - The number of the sample point
n - Total number of data points

2) Second calculate the S^2 for the sample group

$$S^2 = (n-1)s^2$$ [GEN02]

Where;
s^2 - Unbiased estimate of the sample population variance
n - Total number of data points

3) Third calculate the D' value for the sample group

$$D' = \frac{T}{S}$$ [GEN02]

2.9. Drift Bias Determination

If an instrument or group of instruments consistently drifts predominately in one direction the drift is assumed to have a bias. When the absolute value of the calculated average for the sample pool exceeds the values in Table 4 of the Vermont Yankee Instrument Drift Analysis Design Guide for the given sample size and calculated standard deviation, the average is treated as a bias to the drift term. The application of the bias must be carefully considered so that the overall drift term is not reduced in the non-conservative direction. The maximum values of non-biased mean (Xcrit) for a given standard deviation (s) and sample size (n) is calculated using the following formula:

$$x_{crit} = t \times \frac{s}{\sqrt{n}}$$ [GEN02]

where;
Xcrit = Maximum value of non-biased mean for a given s & n, expressed in %
t = Normal Deviate for a t-distribution @ 0.025 for 95% Confidence
s = Standard Deviation of sample pool
n = Sample pool size

2.10. Random Analyzed Drift (DA_R) Determination for IRM

The Analyzed Drift Value must be computed for the entire IRM module, for the trip functions. For a given trip function, the IRM trip circuit, the IRM AR-15 zero circuit, and the IRM Z-14 zero circuit contribute to the drift uncertainty. [Note: The AR-15 zero circuit and Z-14 zero circuits are analyzed together, and therefore, the drift value derived for the zero circuit applies to each circuit, individually.] Therefore, since the Analyzed Drift terms are random and independent of each other, the Analyzed Drift Value is computed per the following equation, and the result is displayed in Table 11. [Table 11]

$$DA_R = \sqrt{DA_{TRIP}^{\ 2} + DA_{ZERO}^{\ 2} + DA_{ZERO}^{\ 2}}$$ [GEN03]

where: DA_{TRIP} = STDEV x 95/95 TIF for the IRM Trip Circuits
DA_{ZERO} = STDEV x 95/95 TIF for the IRM Zero Circuits
DA_R = Total Random Analyzed Drift Term for IRM

Note: The DA_{ZERO} term is included twice to account for the Z-14 and AR-15 effects.

The DA_R term is also converted to process units in Table 11 by multiplying the results by the device process span (0-125 Units). [Table 11]

2.11. Verification of Software

The use of Microsoft Excel Software for the drift calculations has been verified in accordance with the "Vermont Yankee Drift Analysis Design Guide" and AP-0017, "Calculations and Analyses." The Verification and Validation (V&V) for the Microsoft Excel spreadsheets was developed in the initial issue of Calculation VYC-1599 and is included as an attachment to VYC-1599 Rev. 0. The approved V&V provides an acceptable baseline calculation and the justification for using the Microsoft Excel Software to calculate drift statistics without having to manually verify the computations.

[GEN02, GEN01, GEN08]

3. INPUTS AND ASSUMPTIONS

3.1. Calibration Data

All data inputs (raw historical data, setpoints and calibration tolerances) were obtained from the following sources:

3.1.1. OP-4301, Revisions 13-17, Intermediate Range Monitor Functional / Calibration (Historical Procedure Runs for Calibrations) [D-IN01]

3.1.2. All other data was obtained from EMPAC / Vermont Yankee I&C Calibration Database. [GEN07]

3.2. Component References

Manufacturer, Model, Range, Location, etc. were obtained from EMPAC and VYEM-0213.[GEN07, D-IN03]

3.3. Calculation Equations

All equations used in this calculation were obtained from the "Vermont Yankee Instrument Drift Analysis Design Guide", Microsoft Excel Version 97SR-2 (and Microsoft EXCEL 2000) and EPRI TR-103335, Rev. 1, Guidelines For Instrument Calibration Extension/Reduction Programs. [GEN02, GEN06, GEN04]

3.4. Data Assumptions

3.4.1. The data from the test groups is assumed to be normally distributed. The probability plots and histograms in Attachments 8 and 14 validate the assumption of normality for these data sets. For the zero circuits, the D Prime test also validates the assumption of normality. Verification of the assumption of normality is further discussed in Section 5.3. [Att. 8 &14]

3.4.2. The initial entry of data into Microsoft Excel Spreadsheets was 100% verified for accuracy of entry. Subsequent data added to the original set has been randomly verified by a second person to ensure that the new data was accurately entered.

3.4.3. Data entry errors by the technician performing the calibrations, the data entry person entering the data into Microsoft Excel, etc. is assumed to be detected by the outlier tests performed in Attachments 7 & 13. No outliers were identified for evaluation or correction for this calculation. [Att. 8 &14]

3.4.4. Microsoft Excel stores numbers with 15 digits of accuracy; all calculation outputs displayed within this calculation are rounded from the values stored by Microsoft Excel. Rounding errors induced by Microsoft Excel are assumed to be negligible within this calculation. [GEN06]

4. CALCULATION / ANALYSIS

The detailed calculation of the devices listed in Table 1 (IRM Equipment Summary) was performed using Microsoft Excel. Refer to Attachments 3-14 for the calculation spreadsheets and to the "Vermont Yankee Instrument Drift Analysis Design Guide" for all equations used.

[GEN02 & Att. 3-14]

4.1. Explanation of Expelled Data

The data presented in Attachments 3 and 9 reflects calibration history for the IRMS, and data sample exclusions are noted below. Due to the cost associated with collecting data prior to 1993, no new data was collected prior to that time.

In order to exclude data from a sample pool, justification must be provided. To provide this justification, the Surveillance Sheets and applicable Work Orders were reviewed (Refer to Attachments 1 and 2). The following is a summary of the data excluded from the analysis:

4.1.1. IRM 7-41D – Two tests were run on 4/25/98. The first was a normal calibration, and the second was Post Maintenance Testing for Work Order 98-03854-00, which was written because of inoperative transition for IRM D from Range 9 to Range 10 during calibration. The only difference between trip settings from the normal calibration to the PMT was for the 7-41D SCRAM setting. During calibration, the setting was measured as 117.5 Units. During the PMT, the setting was measured at 118 Units. Both readings are within the required tolerance, and no adjustments were made during either procedure run for this setting. Therefore, the As Found for this date was entered as 117.5 Units and the As Left was entered as 118 Units. This conservatively maximizes the drift readings for this device. [Att. 3]

4.1.2. IRM 7-41D - The As Left data for the Z-14 zero reading on 5/9/2001 is illegible; therefore, this As Left value was excluded. [Att. 9]

4.1.3. IRM 7-41D – Two tests were run on 4/25/98. The first was a normal calibration, and the second was Post Maintenance Testing for Work Order 98-03854-00, which was written because of inoperative transition for IRM D from Range 9 to Range 10 during calibration. The only difference between zero settings from the normal calibration to the PMT was for the 7-41D Z-14 circuit. During calibration, the setting was measured as 0 Vdc. During the PMT, the setting was measured at 0.3 mVdc. Both readings are within the required tolerance, and no adjustments were made during either procedure run for this setting. Therefore, the As Found for this date was entered as 0 Vdc and the As Left was entered as 0.0003 Vdc. This conservatively maximizes the drift readings for this device. [Att. 9]

4.1.4. IRM 7-41E - The IRM drawer was repaired per W.O. 93-07995-00 on 9/26/93. The voltage preamp was replaced. Since the voltage preamp can affect the Z-14 zero reading, the As Found data for the Z-14 zero measurement was excluded. [Att. 9]

4.2. Statistics Calculations

4.2.1. The statistics calculations for the trip circuit and zero circuits are documented in Attachments 7 and 13. [Att. 7 & 13]

4.2.2. The TIF used in this analysis is for a 95%/95% level of confidence and is listed in Table 11 (Statistical Summary) for the trip and zero circuits. [Att. 7 & 13]

4.2.3. The statistics summary for the trip and zero circuits can be found in Table 11 (Statistical Summary) and at the end of Attachments 7 and 13. [Att. 7 & 13]

4.3. Plots

4.3.1. The XY Scatter Plots, Regression lines, Time Dependency plots, Histograms and Probability plots used for determining the characteristics of the data are contained in Attachments 8 and 14. [Att. 8 & 14]

5. SUMMARY OF RESULTS / CONCLUSIONS

5.1. Groupings

The six Intermediate Range Monitors were analyzed for drift as a single group. Within the IRMs, the components were split into trip circuits and zero circuits. Based on similarity of circuitry and function, and based on similarity in statistics and t-Test results, all trip circuits were combined for analysis, and both zero adjustment circuits were combined for analysis. Therefore, the two groups analyzed within this calculation are the IRM trip circuits and the IRM zero circuits. The Analyzed Drift results are combined to obtain an overall Analyzed Drift figure for the IRMs. Refer to Attachments 7 and 13 for the statistics for each group.

5.2. Time Dependency

A specific time dependency analysis is not necessary for the IRMs, since the Instrument Resetting Evaluation produced a very significant number of drift data values for the intended surveillance interval of 24-30 months. However, the Time Dependency plots are used to determine if a significantly increasing trend is evident. If no time dependent trend is evident, then the average and standard deviations of the final data set may be used directly to determine the Analyzed Drift Values.

The time dependency calls are made by interpreting the Time Dependency Plot and associated data table, XY Scatter Plots, and Regression Lines. There are three levels of calls made for time dependency; No Time Dependency, Moderate Time Dependency and Strong Time Dependency. [GEN02]

Time Dependency strength (Strong, Moderate, None) was determined by reviewing the Time Dependency Plot, XY Scatter Plots and Regression Plots. Data exhibiting No Time Dependency requires no manipulation of the Analyzed Drift Value, since significant drift data already exists for the trip circuits and the zero circuits in the 24-30 month time intervals for the IRMs, which is the desired surveillance interval. [GEN02]

5.3. Normality

To determine if a distribution is normally distributed a sample counting technique was used per Section 3.8.6 of GEN02. This technique calculates the Standard Deviation of the outlier-tested data and counts how many samples fall within 1σ and 2σ. Then the Probability plots and Histograms are reviewed and the determination is made on the type of distribution displayed by the data set. In addition, a D-Prime test is performed for the zero circuits, which is documented herein. The D-Prime test was not performed for the IRM trip circuits, since the drift values are discrete values because of the readability of the local panel meter. This fact makes the standard statistical test for normality of little use.

5.4. Analyzed Drift Determination

The bias portion of the analyzed drift is tested for significance per the methodology of Section 2.9. The random portion of the Analyzed Drift is determined from the Analyzed Drift of the IRM trip circuits and the IRM zero circuits, per the methodology of Section 2.10.

5.5. Time Dependency, Normality & Drift Bias Results

5.5.1. IRM Trip Circuits [Att. 3-8]

Table 4 – IRM Trip Circuit Time Dependency Bins

Range	Count	% of Total	Average Interval	STDEV	Average
0-600	21	28%	29	0.3894%	0.0190%
601-913	18	24%	821	0.4339%	0.0000%
>913	36	48%	982	0.4329%	-0.2000%

The data presented on the Time Dependency plot, XY Scatter plots, and Regression lines Attachment 8 and the data in Table 4 above shows no time dependency. Data is analyzed at calibration intervals up to and exceeding the required 24-30 months, via an Instrument Resetting Evaluation, so no extrapolation of drift values is required.

Table 5 – IRM Trip Circuit Distribution Percentages

IRM Trip Circuits	Normal Distribution	Data
1 Standard Deviation	68.27%	62.67%
2 Standard Deviations	95.45%	94.67%

The data presented on the XY Scatter Plots, Probability Plots and Histogram in Attachment 8 and the data in Table 5 above shows that the data is fairly evenly distributed about zero and exhibits a normal distribution.

Table 6 – IRM Trip Circuit Drift Bias Determination

Mean Bias Determination	IRM Trip Circuit
Count	75
Average (Absolute Value)	0.0907%
Standard Deviation	0.4291%
Absolute Value of Maximum Allowed Average	0.098%
Mean Bias	No

The data presented in Table 6 above shows that the data does not exhibit a drift bias.

5.5.2. IRM Zero Circuits [Att. 9-14]

Table 7 – IRM Zero Circuit Time Dependency Bins

Range	Count	% of Total	Average Interval	STDEV	Average
0-182	31	37%	80	0.1521%	0.0306%
183-365	14	17%	233	0.1416%	-0.0251%
366-548	12	14%	490	0.1745%	-0.0230%
549-731	4	5%	602	0.1097%	0.0328%
>731	23	27%	861	0.0956%	-0.0253%

The data presented on the Time Dependency plot, XY Scatter plots, and Regression lines of Attachment 8 and the data in Table 7 above shows no time dependency. Data is analyzed at calibration intervals up to the required 24-30 months, via an Instrument Resetting Evaluation, so no extrapolation of drift values is required.

Table 8 – IRM Zero Circuit Distribution Percentages

IRM Zero Circuits	Normal Distribution	Data
1 Standard Deviation	68.27%	59.52%
2 Standard Deviations	95.45%	97.62%

Table 9 – IRM Zero Circuit D-Prime Test Results

IRM Zero Circuits	Data
D-Prime Upper Acceptance Limit	220.30
Calculated D-Prime Value	219.25
D-Prime Lower Acceptance Limit	210.60

The data presented on the XY Scatter Plots, Probability Plots and Histogram in Attachment 14 and the data in Table 8 above shows that the data is fairly evenly distributed about zero and exhibits a normal distribution. The D-Prime test results shown in Table 9 above also support the assumption of normality for this data set, since the calculated D-Prime value lies between the upper and lower acceptance limits.

Table 10 – IRM Zero Circuit Drift Bias Determination

Mean Bias Determination	IRM Zero Circuit
Count	84
Average (Absolute Value)	0.0016%
Standard Deviation	0.1384%
Absolute Value of Maximum Allowed Average	0.030%
Mean Bias	No

The data presented in Table 5D above shows that the data does not exhibit a drift bias.

5.6. Summary

Refer to Section 2.3 for the explanation of the data analysis and Table 11 Statistical Summary for values to use in Setpoint Uncertainty calculations. Refer to Table 11 Endnotes for description of identified Drift Terms.

Table 11 - Statistical Summary

GROUP	IRM Trip Circuit	IRM Zero Circuit
COUNT	75	84
AVG INTERVAL	676	403
AVERAGE	-0.0907%	-0.0016%
STDEV	0.4291%	0.1384%
VARIANCE	0.0018%	0.0002%
KURTOSIS	-0.370	-0.557
SKEWNESS	-0.070	-0.008
MAXIMUM	0.8000%	0.3300%
MINIMUM	-0.8000%	-0.2920%
95%/95% TIF	2.265	2.272
STDEV x 95/95 TIF	0.9804%	0.3145%
% OF ORIG CNT	100.00%	100.00%
G. E. MODEL	194X672G8 Trip Circuits	194X672G8, AR-15 and Z-14 Zero Adjustments
RANGE	0-125 Units	0-125 Units
DA_R (% Span)	±1.077% Span	
DA_R (Units)	±1.346 Units	
DA_{BR}	None	

TABLE 11 ENDNOTES:

Note: The statistical summaries for each of the individual Component Groups are listed in Attachments 7 and 13.

DA_R = Total IRM Analyzed Drift Term for a Refueling Calibration Interval.
DA_{BR} = Total IRM Drift Bias associated with the DA Term for a Refueling Calibration Interval.

5.7. Conclusions

The Analyzed Drift (AD) value for the Intermediate Range Monitors (IRMs) is determined to be ±1.077% Span (±1.346 / 125 units) for nominal calibration intervals up to 24 months, not to exceed a maximum allowed interval of 30 months. The drift is determined to be time independent, and the bias value of the drift is determined to be negligible. The drift value established within VYC-692A, Rev. 0 for the IRMs is conservative with respect to the Analyzed Drift determined in this calculation.

5.8. Calculation Review and Impact Considerations

5.8.1. This calculation does not assess conformance to 10 CFR 50.46, "Acceptance Criteria for ECCS for Light Water Nuclear Power Reactors," and Appendix K, "ECCS Evaluation Models". The results of this calculation do not identify errors or require changes to the OPL-4 LOCA analysis model. Therefore, the reporting requirements of 10 CFR 50.46 are not applicable.

5.8.2. A review of the Vermont Yankee Event Report Database was conducted to identify any Event Reports that would impact this calculation. No applicable Event Reports were identified.

5.8.3. There are no calculations used for design input to this calculation, therefore there is no impact based upon the results of this calculation on precursor calculations.

5.8.4. A review identified one successor calculation that utilizes output from this calculation and it has been identified as a Design Output Document on the applicable VYAPF 0017.07 Form. An impact review for this calculation identified the following:

- VYC-692A Rev. 0 for IRMs 7-41A-F - The drift values used are conservative with respect to the results of this calculation. No immediate impact. VYC-692A should be updated at the next revision to document the drift analysis results.

The above calculation has been identified on VYAPF 0017.05, "Open Item List", to ensure appropriate disposition of the identified impacts. [Att. 15]

5.8.5. This calculation is not an implementing document and a 50.59 screen or evaluation is not required. The output of this calculation is implemented through other calculations. These successor calculations will identify the need for update to applicable plant documents. The downstream process that updates applicable output documents from successor calculations will satisfy the 50.59 evaluation requirements.

5.9. Calculation Implementation Requirements, Restrictions and Limitations

5.9.1. Use of analyzed drift values for components / loops in Setpoint and Uncertainty Calculations which require Rigor Level 1 or 2 analysis as defined in the "Vermont Yankee Instrument Drift Analysis Design Guide", Revision 1, must be included in the data groups identified within this calculation. [GEN02]

IRM Maintenance History Review

Work Order #	Event Description	Comments
01-001704-001	IRM D needs to be replaced. Detector determined to be failed using WO 01-1704.	Failure is self-revealing. No impact to Functional/Calibration test extension.
01-001153-000	Troubleshoot: IRM D is erratic on range 2.	Failure is self-revealing. No impact to Functional/Calibration test extension.
01-002199-000	Change out pre-amplifier. IRM D is noisy and is required to be bypassed during plant startup.	Failure is self-revealing. No impact to Functional/Calibration test extension.
01-001152-000	Replace IRM C detector. IRM C is erratic in range 2.	Failure is self-revealing. No impact to Functional/Calibration test extension.
00-000357-000	Clip a radioactive detector (IRM A) from a new detector cable (failed testing) and forward detector to the Radwaste Supervisor.	Failure is self-revealing. No impact to Functional/Calibration test extension.
99-010741-000	IRM A jumped up to 60 for no reason.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
99-010428-000	Perform IV curve on IRM E detector with I/C Engineer. During shutdown, IRM E was erratic for first few hours.	Failure is self-revealing. No impact to Functional/Calibration test extension.
99-010595-000	IRM D detector requires range correlation adjustment (range 6 to 7) during next startup or shutdown.	Failure is self-revealing. No impact to Functional/Calibration test extension.
99-010674-000	IRM E caused half scrams last night and has a very strange trace.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
99-010674-001	Replace IRM E detector. IRM E caused half scrams last night and has a very strange trace.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
99-010749-000	IRM F spiking upscale while being withdrawn, had to shift up to range 3 to minimize. Troubleshoot.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
99-010749-001	Replace IRM F detector. IRM F spiking upscale while being withdrawn, had to shift up to range 3 to minimize.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
99-011416-000	IRM D will not withdraw all the way. Troubleshoot.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
98-003854-000	OP4301 range function for IRM D does not operate properly between ranges 9 and 10.	Failure is self-revealing. No impact to Functional/Calibration test extension.
98-005028-000	IRM C did not respond during startup.	Failure is self-revealing. No impact to Functional/Calibration test extension.
98-005064-000	IRM C detector not outputting to associated pre-amp.	Failure is self-revealing. No impact to Functional/Calibration test extension.

IRM Maintenance History Review

Work Order #	Event Description	Comments
98-011490-000	IRM D spiked upscale twice while attempting to range down from 9 to 8 causing half scrams.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
97-007589-000	During startup, IRM A failed downscale when in range 6 or below.	Failure is self-revealing. No impact to Functional/Calibration test extension.
97-007969-000	IRM D spiked upscale for no apparent reason.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
97-010993-000	IRM E spiked high causing half scram, investigate and repair.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
97-010994-000	IRM F spiking high for no reason, investigate and repair.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
96-010997-000	IRM B is erratic	Failure is self-revealing. No impact to Functional/Calibration test extension.
96-011061-000	IRM B failed downscale when placed on range 7 after being at a reading of 75 on range 6.	Failure is self-revealing. No impact to Functional/Calibration test extension.
95-000273-000	Replace IRM A connector.	Preplanned maintenance. No impact to Functional/Calibration test extension.
95-000275-000	Replace IRM B connector.	Preplanned maintenance. No impact to Functional/Calibration test extension.
95-000277-000	Replace IRM C connector.	Preplanned maintenance. No impact to Functional/Calibration test extension.
95-000278-000	Replace IRM D connector.	Preplanned maintenance. No impact to Functional/Calibration test extension.
95-000279-000	Replace IRM E connector.	Preplanned maintenance. No impact to Functional/Calibration test extension.
95-000280-000	Replace IRM F connector.	Preplanned maintenance. No impact to Functional/Calibration test extension.
95-010901-000	IRM D spiked twice during scram reset.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
95-010901-001	IRM D spiking causing half scrams.	Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
94-003191-000	Spurious trips received from IRM E when performing retract/insert during performance of OP 4301.	IRM upscale and downscale spikes were noted during performance of OP 4301, Step 12 (related to Control Rod

IRM Maintenance History Review

Work Order #	Event Description	Comments
94-003191-000 (continued)		Block Function), during IRM E retract/insert. Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
93-007995-000	On 9/25/93, for IRM E, Step 3.d of procedure OP 4301 was out of tolerance and not able to adjust voltage pre-regulator.	Drawer for IRM E was repaired, with Voltage Preamp being replaced on 9/26/93.

IRM Maintenance Rule Performance History Review

Event Date	Description	Comments
5/20/01	After moving mode switch to run, withdrew all IRMs, IRM A did not withdraw. "In" lights blinked several times	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
5/19/01	During plant startup, IRM D was noted to be spiking. IRM D was bypassed and declared inoperable.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
4/27/01	During plant shutdown, IRM D became erratic. IRM D was declared inoperable and bypassed.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
3/20/01	IRM C declared inoperable due to erratic behavior/spiking.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
11/15/99	During IRM surveillance, an unexpected half scram occurred once on IRM E and once on IRM F when detector withdraw switch was depressed.	Failure is self-revealing. IRMs E and F were declared inoperable. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
11/08/99	Unexpected half scram received as a result of an upscale spike of IRM F. Most likely as a result of welding activities in the drywell.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
11/08/99	When placing the mode switch in shutdown to support outage activities, received 11 separate half scrams from IRM E within a 26 second period. Spiking on IRM E ceased when the scram signal and RPS were reset.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
11/01/99	While performing control rod drive change-outs, a half scram was received due to a spike received on IRM D. Detector cable was probably bumped while working under the reactor vessel.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
10/30/99	Unexpected half scram on IRM E during the performance of Step 12 of OP 4301, withdraw IRM set 5-N-3 (IRM not full in) annunciator "In" light out. Showed a spike up to 75.	Step 12 of OP 4301 is related to Control Rod Block Function. Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
10/30/99	IRM D spiked apparently due to noise resulting in a half scram. No other IRMs showed unusual activity.	Failure discovered during IRM surveillance. However, failure is self-revealing. No impact to Functional/Calibration test extension.
10/16/98	After placing mode switch in startup, IRM D spiked on two separate	Failure discovered during normal plant activities not involving IRM testing.

IRM Maintenance Rule Performance History Review

Event Date	Description	Comments
10/16/98 (continued)	occasions causing separate half scrams.	Failure is self-revealing. No impact to Functional/Calibration test extension.
6/12/98	Planned maintenance to replace the IRM D/F – APRM D/F selector switch due to erratic recorder traces.	Planned maintenance only. This was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
5/26/98	During refueling outage (RFO 20) while performing OP 4301 for IRM A, a half scram was received. The drawer mode switch was in "operate" even though is was thought to be in "standby." When the channel bypass switch was placed in "neutral," a half scram resulted.	Human performance error which was self-revealing. In addition, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension
11/25/97	While driving (inserting) IRMs E and F following a plant scram, a high spike caused a half scram and annunciator alarms. Troubleshooting could not determine the exact cause due to inaccessibility of equipment. Detectors or connectors suspected. Subsequent troubleshooting during RFO 20 identified probable cause to be the detectors.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
5/05/97	While plant was in an unscheduled shutdown, a half scram occurred due to a Hi-Hi condition on IRM D. The Hi-Hi condition was a momentary spike. No work was in progress that could have caused the half scram. Following reset of the half scram, IRM D was considered to be "noisy" but operable.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
7/05/95	Planned preventative maintenance to replace various SRM/IRM coils. WO lists 35 relay component IDs. Work was performed intermittently over a three year period for a total of 23 hours of combined (system) unavailability.	Planned preventative maintenance only. This was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
3/18/95	During refuel, operations received half scram resulting from high signal spike of IRM D.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
10/04/94	During a forced outage for non-related reasons, spurious channel trips were received while performing retract/insert of IRM E during routine testing. IRM E declared inoperable.	IRM upscale and downscale spikes were noted during performance of OP 4301, Step 12 (related to Control Rod Block Function), during IRM E retract/insert. Failure is self-revealing. However, this was not a failure of the RPS IRM Functions. No impact to Functional/Calibration test extension.
10/23/93	While the plant was increasing power	Failure discovered during normal plant

IRM Maintenance Rule Performance History Review

Event Date	Description	Comments
10/23/93 (continued)	following a refueling outage, it was noted that IRM D was spiking high and causing half scrams. IRM D was declared inoperable and bypassed. The exact cause of spiking could not be determined. Suspected that drawer connectors might be dirty.	activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
4/19/92	During plant startup following refueling, IRM E would not respond due to detector connector problem. IRM E declared inoperable.	Failure discovered during normal plant activities not involving IRM testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
3/14/92	With the plant shutdown for refueling and performing IRM signal-to-noise ratio tests, it was found that IRM E could not be driven to full-in position. Undersized fuses were found in a recently installed upgraded motor module. IRM E declared inoperable.	Failure discovered during normal plant activities not involving IRM Functional/Calibration testing. Failure is self-revealing. No impact to Functional/Calibration test extension.
3/06/92	During plant power descent (27.5% power), the signal from IRM F was lost while IRM F was being driven in during overlap verification. IRM F declared inoperable.	Failure discovered during normal plant activities not involving IRM Functional/Calibration testing. Failure is self-revealing. No impact to Functional/Calibration test extension.

Intermediate Range Monitors			7-41A-F							CALIBRATION FILE		DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	HI HI SCRAM	HI HI SCRAM	
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41A	5/12/01	5	9.0	9.0	0.0%	104.0	104.0	0.0%	116.0	116.0	0.0%	
7-41A	5/7/01	8	9.0	9.0	0.0%	104.0	104.0	0.0%	116.0	116.0	0.0%	IRMs A, C, and E Tested
7-41A	4/29/01	5	9.0	9.0	-0.4%	104.0	104.0	0.4%	116.0	116.0	0.0%	
7-41A	4/24/01	35	6.0	9.5	0.0%	106.0	103.5	0.0%	118.0	116.0	0.0%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41A	3/20/01	187	6.0	6.0	-0.2%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41A	9/14/00	290	6.2	6.2	0.2%	106.0	106.0	-0.8%	118.0	118.0	0.0%	
7-41A	11/29/99	4	6.0	6.0	0.0%	107.0	107.0	0.0%	118.0	118.0	-0.8%	Only IRM A Checked
7-41A	11/25/99	10	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41A	11/15/99	12	6.0	6.0	0.0%	106.0	106.0	0.0%	119.0	119.0	0.8%	
7-41A	11/3/99	4	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41A	10/30/99	3	6.0	6.0	0.0%	105.5	105.5	-1.2%	118.0	118.0	0.4%	
7-41A	10/27/99	376	6.0	6.0	-0.4%	107.0	107.0	0.8%	117.5	117.5	-0.4%	
7-41A	10/16/98	128	6.5	6.5	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41A	6/10/98	15	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41A	5/26/98	31	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41A	4/25/98	7	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41A	4/18/98	23	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41A	3/26/98	5	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	-0.8%	
7-41A	3/21/98	4	6.0	6.0	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.8%	
7-41A	3/17/98	112	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41A	11/25/97	89	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41A	8/28/97	108	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	Only IRMs A-E Tested.
7-41A	5/12/97	11	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	0.0%	
7-41A	5/1/97	6	6.0	6.0	0.0%	107.0	107.0	0.8%	118.0	118.0	0.0%	
7-41A	4/25/97	182	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	-0.8%	
7-41A	10/25/96	7	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.8%	
7-41A	10/18/96	6	6.0	6.0	0.0%	107.0	107.0	0.0%	118.0	118.0	-0.8%	
7-41A	10/12/96	11	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41A	10/1/96	24	6.0	6.0	-0.8%	107.0	107.0	0.4%	119.0	119.0	0.8%	
7-41A	9/7/96	4	7.0	7.0	0.8%	106.5	106.5	0.4%	118.0	118.0	-0.8%	
7-41A	9/3/96	270	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.8%	
7-41A	12/8/95	223	6.0	6.0	0.0%	107.0	107.0	0.4%	118.0	118.0	-0.8%	
7-41A	4/29/95	7	6.0	6.0	0.0%	106.5	106.5	0.4%	119.0	119.0	0.0%	
7-41A	4/22/95	14	6.0	6.0	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.8%	

Intermediate Range Monitors			7-41A-F								CALIBRATION FILE	DRIFT ANALYSIS
		(Days)	Initial Data DNSCL ROD BLOCK	Initial Data DNSCL ROD BLOCK	Raw Drift Data DNSCL ROD BLOCK	Initial Data HI ROD BLOCK	Initial Data HI ROD BLOCK	Raw Drift Data HI ROD BLOCK	Initial Data HI HI SCRAM	Initial Data HI HI SCRAM	Raw Drift Data HI HI SCRAM	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41A	4/8/95	14	6.5	6.5	0.4%	106.0	106.0	-0.8%	118.0	118.0	0.0%	
7-41A	3/25/95	7	6.0	6.0	0.0%	107.0	107.0	0.4%	118.0	118.0	0.0%	
7-41A	3/18/95	3	6.0	6.0	0.0%	106.5	106.5	0.0%	118.0	118.0	-0.8%	
7-41A	3/15/95	151	6.0	6.0	0.0%	106.5	106.5	-0.4%	119.0	119.0	0.8%	
7-41A	10/15/94	1	6.0	6.0	0.0%	107.0	107.0	0.4%	118.0	118.0	0.0%	
7-41A	10/14/94	10	6.0	6.0	0.0%	106.5	106.5	0.4%	118.0	118.0	-0.8%	
7-41A	10/4/94	5	6.0	6.0	0.0%	106.0	106.0	0.0%	119.0	119.0	0.0%	
7-41A	9/29/94	172	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41A	4/10/94	113	7.0	6.0	0.8%	107.0	107.0	0.0%	119.0	119.0	0.0%	Difference exists between As Found and As Left for Downscale Rod Block. Both values are within specification, but the As Left is actually farther out than the As Found. Because values differ, assume that the setting was adjusted, as shown.
7-41A	12/18/93	1	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41A	12/17/93	10	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41A	12/7/93	4	6.0	6.0	-0.4%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41A	12/3/93	43	6.5	6.5	-0.8%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41A	10/21/93	7	7.5	7.5	0.4%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41A	10/14/93	11	7.0	7.0	0.4%	107.0	107.0	0.0%	119.0	119.0	0.8%	
7-41A	10/3/93	8	6.5	6.5	-0.4%	107.0	107.0	0.8%	118.0	118.0	-0.8%	
7-41A	9/25/93	7	7.0	7.0	0.8%	106.0	106.0	0.0%	119.0	119.0	0.0%	
7-41A	9/18/93	8	6.0	6.0	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.0%	
7-41A	9/10/93	7	6.5	6.5	0.4%	106.0	106.0	-0.4%	119.0	119.0	0.8%	
7-41A	9/3/93	6	6.0	6.0	-0.4%	106.5	106.5	-0.4%	118.0	118.0	0.0%	
7-41A	8/28/93	4	6.5	6.5	0.0%	107.0	107.0	0.0%	118.0	118.0	-0.8%	
7-41A	8/24/93		6.5	6.5		107.0	107.0		119.0	119.0		
7-41B	5/12/01	3	9.0	9.0	0.4%	104.0	104.0	0.4%	115.0	115.0	0.0%	
7-41B	5/9/01	10	8.5	8.5	0.0%	103.5	103.5	-0.4%	115.0	115.0	-0.8%	IRMs B, D and F Tested.
7-41B	4/29/01	5	8.5	8.5	-0.8%	104.0	104.0	0.4%	116.0	116.0	0.4%	
7-41B	4/24/01	35	6.0	9.5	0.0%	106.5	103.5	-0.4%	118.0	115.5	-0.8%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41B	3/20/01	187	6.0	6.0	-0.2%	107.0	107.0	1.2%	119.0	119.0	0.0%	

Intermediate Range Monitors			7-41A-F							CALIBRATION FILE		DRIFT ANALYSIS
												Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
		(Days)	Initial Data DNSCL ROD BLOCK	Initial Data DNSCL ROD BLOCK	Raw Drift Data DNSCL ROD BLOCK	Initial Data HI ROD BLOCK	Initial Data HI ROD BLOCK	Raw Drift Data HI ROD BLOCK	Initial Data HI HI SCRAM	Initial Data HI HI SCRAM	Raw Drift Data HI HI SCRAM	
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41B	9/14/00	294	6.2	6.2	0.2%	105.5	105.5	-1.2%	119.0	119.0	0.0%	
7-41B	11/25/99	10	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	11/15/99	12	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41B	11/3/99	4	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41B	10/30/99	3	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41B	10/27/99	376	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41B	10/16/98	128	6.0	6.0	-0.8%	106.0	106.0	-0.8%	118.0	118.0	-0.4%	
7-41B	6/10/98	15	7.0	7.0	0.8%	107.0	107.0	0.8%	118.5	118.5	-0.4%	
7-41B	5/26/98	31	6.0	6.0	-0.8%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41B	4/25/98	7	7.0	7.0	0.8%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	4/18/98	23	6.0	6.0	-0.4%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41B	3/26/98	5	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	-0.8%	
7-41B	3/21/98	4	6.0	6.0	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.4%	
7-41B	3/17/98	112	6.5	6.5	0.4%	106.0	106.0	0.0%	118.5	118.5	-0.4%	
7-41B	11/25/97	89	6.0	6.0	-0.8%	106.0	106.0	-0.8%	119.0	119.0	0.8%	
7-41B	8/28/97	108	7.0	7.0	0.8%	107.0	107.0	0.0%	118.0	118.0	-0.8%	Only IRMs A-E Tested.
7-41B	5/12/97	11	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	5/1/97	6	6.0	6.0	-0.4%	107.0	107.0	0.4%	119.0	119.0	0.0%	
7-41B	4/25/97	182	6.5	6.5	0.4%	106.5	106.5	0.4%	119.0	119.0	0.0%	
7-41B	10/25/96	7	6.0	6.0	-0.4%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41B	10/18/96	6	6.5	6.5	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	10/12/96	11	6.5	6.5	0.4%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41B	10/1/96	24	6.0	6.0	-0.4%	106.0	106.0	-0.4%	118.0	118.0	-0.4%	
7-41B	9/7/96	4	6.5	6.5	0.4%	106.5	106.5	0.0%	118.5	118.5	-0.4%	
7-41B	9/3/96	270	6.0	6.0	0.0%	106.5	106.5	-0.4%	119.0	119.0	0.0%	
7-41B	12/8/95	223	6.0	6.0	0.0%	107.0	107.0	0.4%	119.0	119.0	0.0%	
7-41B	4/29/95	7	6.0	6.0	0.0%	106.5	106.5	0.0%	119.0	119.0	0.8%	
7-41B	4/22/95	14	6.0	6.0	-0.8%	106.5	106.5	0.0%	118.0	118.0	-0.8%	
7-41B	4/8/95	14	7.0	7.0	0.4%	106.5	106.5	-0.4%	119.0	119.0	0.0%	
7-41B	3/25/95	7	6.5	6.5	-0.4%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	3/18/95	3	7.0	7.0	0.4%	107.0	107.0	0.4%	119.0	119.0	0.0%	
7-41B	3/15/95	151	6.5	6.5	-0.4%	106.5	106.5	-0.4%	119.0	119.0	0.0%	
7-41B	10/15/94	1	7.0	7.0	0.8%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41B	10/14/94	10	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41B	10/4/94	5	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.8%	
7-41B	9/29/94	172	6.0	6.0	-0.4%	107.0	107.0	0.8%	118.0	118.0	0.0%	
7-41B	4/10/94	113	6.5	6.5	0.4%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41B	12/18/93	1	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	12/17/93	10	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.0%	

Intermediate Range Monitors			7-41A-F							CALIBRATION FILE		DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	HI HI SCRAM	HI HI SCRAM	Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41B	12/7/93	4	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41B	12/3/93	43	6.0	6.0	-0.4%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41B	10/21/93	7	6.5	6.5	0.4%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41B	10/14/93	11	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41B	10/3/93	8	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41B	9/25/93	7	6.0	6.0	-0.4%	106.0	106.0	-0.4%	119.0	119.0	0.0%	
7-41B	9/18/93	8	6.5	6.5	-0.4%	106.5	106.5	0.4%	119.0	119.0	0.0%	
7-41B	9/10/93	7	7.0	7.0	0.0%	106.0	106.0	-0.4%	119.0	119.0	0.0%	
7-41B	9/3/93	6	7.0	7.0	0.8%	106.5	106.5	-0.4%	119.0	119.0	0.4%	
7-41B	8/28/93	4	6.0	6.0	0.0%	107.0	107.0	0.0%	118.5	118.5	-0.4%	
7-41B	8/24/93		6.0	6.0		107.0	107.0		119.0	119.0		
7-41C	5/12/01	5	9.0	9.0	0.0%	104.0	104.0	-0.4%	115.0	115.0	-1.2%	
7-41C	5/7/01	8	9.0	9.0	0.0%	104.5	104.5	0.4%	116.5	116.5	0.0%	IRMs A, C, and E Tested
7-41C	4/29/01	5	9.0	9.0	0.0%	104.0	104.0	0.0%	116.5	116.5	0.4%	
7-41C	4/24/01	35	7.0	9.0	0.8%	105.0	104.0	-0.8%	117.5	116.0	0.0%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41C	3/20/01	187	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	9/14/00	294	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	11/25/99	10	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	11/15/99	12	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	11/3/99	4	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41C	10/30/99	3	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	10/27/99	376	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	10/16/98	128	6.5	6.5	0.0%	106.0	106.0	-0.4%	118.0	118.0	0.0%	
7-41C	6/10/98	15	6.5	6.5	0.4%	106.5	106.5	0.4%	118.0	118.0	0.4%	
7-41C	5/26/98	31	6.0	6.0	-0.4%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	4/25/98	7	6.5	6.5	-0.4%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41C	4/18/98	23	7.0	7.0	0.8%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41C	3/26/98	5	6.0	6.0	0.0%	106.0	106.0	0.4%	117.5	117.5	0.0%	
7-41C	3/21/98	4	6.0	6.0	-0.4%	105.5	105.5	-0.4%	117.5	117.5	0.0%	
7-41C	3/17/98	112	6.5	6.5	0.4%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	11/25/97	89	6.0	6.0	-0.4%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41C	8/28/97	108	6.5	6.5	0.4%	106.0	106.0	0.0%	117.5	117.5	-0.4%	Only IRMs A-E Tested.
7-41C	5/12/97	11	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41C	5/1/97	6	6.0	6.0	-0.8%	106.0	106.0	0.4%	117.5	117.5	-0.4%	

Intermediate Range Monitors			7-41A-F								CALIBRATION FILE	DRIFT ANALYSIS
		(Days)	Initial Data DNSCL ROD BLOCK	Initial Data DNSCL ROD BLOCK	Raw Drift Data DNSCL ROD BLOCK	Initial Data HI ROD BLOCK	Initial Data HI ROD BLOCK	Raw Drift Data HI ROD BLOCK	Initial Data HI HI SCRAM	Initial Data HI HI SCRAM	Raw Drift Data HI HI SCRAM	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41C	4/25/97	182	7.0	7.0	0.8%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41C	10/25/96	7	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	10/18/96	6	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	10/12/96	11	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41C	10/1/96	24	6.0	6.0	-0.8%	105.5	105.5	-0.8%	118.0	118.0	-0.4%	
7-41C	9/7/96	4	7.0	7.0	0.8%	106.5	106.5	0.4%	118.5	118.5	0.8%	
7-41C	9/3/96	270	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41C	12/8/95	223	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.4%	
7-41C	4/29/95	7	6.0	6.0	0.0%	105.5	105.5	-0.4%	117.5	117.5	-0.4%	
7-41C	4/22/95	14	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	4/8/95	14	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41C	3/25/95	7	6.0	6.0	-0.8%	106.0	106.0	-0.4%	117.5	117.5	0.0%	
7-41C	3/18/95	3	7.0	7.0	0.8%	106.5	106.5	0.8%	117.5	117.5	-0.8%	
7-41C	3/15/95	151	6.0	6.0	0.0%	105.5	105.5	-0.4%	118.5	118.5	0.4%	
7-41C	10/15/94	1	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41C	10/14/94	10	6.0	6.0	0.0%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41C	10/4/94	5	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.4%	
7-41C	9/29/94	172	6.0	6.0	-0.4%	105.5	105.5	0.0%	117.5	117.5	0.0%	
7-41C	4/10/94	113	6.5	6.5	0.4%	105.5	105.5	-0.4%	117.5	117.5	0.0%	
7-41C	12/18/93	1	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41C	12/17/93	10	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41C	12/7/93	4	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41C	12/3/93	43	6.0	6.0	-0.8%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	10/21/93	7	7.0	7.0	0.8%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41C	10/14/93	11	6.0	6.0	-0.4%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41C	10/3/93	8	6.5	6.5	-0.4%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41C	9/25/93	7	7.0	7.0	0.8%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41C	9/18/93	8	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	-0.4%	
7-41C	9/10/93	7	6.0	6.0	0.0%	106.0	106.0	0.4%	118.5	118.5	0.8%	
7-41C	9/3/93	6	6.0	6.0	-0.4%	105.5	105.5	-0.4%	117.5	117.5	-0.4%	
7-41C	8/28/93	4	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41C	8/24/93		6.0	6.0		106.0	106.0		118.0	118.0		
7-41D	5/12/01	3	9.0	9.0	0.0%	104.0	104.0	0.8%	116.0	116.0	0.0%	
7-41D	5/9/01	10	9.0	9.0	0.0%	103.0	103.0	-0.8%	116.0	116.0	0.0%	IRMs B, D and F Tested.
7-41D	4/29/01	3	9.0	9.0	-0.4%	104.0	104.0	0.4%	116.0	116.0	-0.4%	
7-41D	4/26/01	2	9.5	9.5	0.4%	103.5	103.5	-0.4%	116.5	116.5	0.4%	Only IRM D Tested.

Intermediate Range Monitors			7-41A-F								CALIBRATION FILE	DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	HI HI SCRAM	HI HI SCRAM	Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41D	4/24/01	35	6.0	9.0	0.0%	105.0	104.0	-1.6%	117.5	116.0	-0.4%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41D	3/20/01	187	6.0	6.0	0.0%	107.0	107.0	0.8%	118.0	118.0	0.4%	
7-41D	9/14/00	294	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41D	11/25/99	10	6.0	6.0	-0.8%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41D	11/15/99	12	7.0	7.0	0.8%	106.0	106.0	0.0%	117.5	117.5	0.0%	
7-41D	11/3/99	4	6.0	6.0	0.0%	106.0	106.0	0.0%	117.5	117.5	-0.4%	
7-41D	10/30/99	3	6.0	6.0	-0.8%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41D	10/27/99	376	7.0	7.0	0.4%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41D	10/16/98	128	6.5	6.5	0.0%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41D	6/10/98	15	6.5	6.5	0.4%	106.0	106.0	0.4%	117.5	117.5	-0.4%	
7-41D	5/26/98	31	6.0	6.0	0.0%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41D	4/25/98	7	6.0	6.0	0.0%	106.0	106.0	-0.8%	117.5	118.0	-0.4%	Two Tests on this Date for IRM D. One was PMT for WO 98-03854-00, which was written because of inoperative transition for IRM D from range 9 to range 10. The other measurement was the normal calibration which detected this problem. The only difference in readings was in HI HI Scram setting. Used calibration for As Found and PMT for As Left. However, no adjustments were made in either procedure run.
7-41D	4/18/98	23	6.0	6.0	0.0%	107.0	107.0	1.2%	118.0	118.0	0.0%	
7-41D	3/26/98	5	6.0	6.0	0.0%	105.5	105.5	-0.4%	118.0	118.0	-0.8%	
7-41D	3/21/98	4	6.0	6.0	-0.4%	106.0	106.0	-0.4%	119.0	119.0	0.8%	
7-41D	3/17/98	112	6.5	6.5	0.4%	106.5	106.5	0.4%	118.0	118.0	0.0%	
7-41D	11/25/97	89	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41D	8/28/97	108	6.5	6.5	0.4%	106.0	106.0	0.0%	117.5	117.5	-0.4%	Only IRMs A-E Tested.
7-41D	5/12/97	11	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	5/1/97	6	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.4%	
7-41D	4/25/97	182	6.5	6.5	0.4%	106.0	106.0	0.0%	117.5	117.5	-0.4%	

Intermediate Range Monitors			7-41A-F								CALIBRATION FILE DRIFT ANALYSIS	
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	HI HI SCRAM	HI HI SCRAM	Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41D	10/25/96	7	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	10/18/96	6	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	10/12/96	11	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41D	10/1/96	24	6.0	6.0	-0.8%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41D	9/7/96	4	7.0	7.0	0.8%	106.0	106.0	0.4%	118.0	118.0	0.0%	W. O. R. 25551 generated for IRM D. Spiking H1. Declared inop, and J1 signal connector was removed. No affect on calibration values.
7-41D	9/3/96	270	6.0	6.0	-0.4%	105.5	105.5	-0.4%	118.0	118.0	0.0%	
7-41D	12/8/95	223	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	4/29/95	7	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	4/22/95	14	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	4/8/95	14	6.5	6.5	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	3/25/95	7	6.5	6.5	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	3/18/95	3	7.0	7.0	0.8%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	3/15/95	151	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.4%	
7-41D	10/15/94	1	6.0	6.0	0.0%	105.5	105.5	-0.4%	117.5	117.5	-0.4%	
7-41D	10/14/94	10	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	10/4/94	5	6.0	6.0	0.0%	106.0	106.0	0.4%	118.0	118.0	0.4%	
7-41D	9/29/94	172	6.0	6.0	-0.4%	105.5	105.5	0.0%	117.5	117.5	-0.4%	
7-41D	4/10/94	113	6.5	6.5	0.4%	105.5	105.5	0.0%	118.0	118.0	0.4%	
7-41D	12/18/93	1	6.0	6.0	0.0%	105.5	105.5	-0.4%	117.5	117.5	-0.4%	
7-41D	12/17/93	10	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	12/7/93	4	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	12/3/93	43	6.0	6.0	-0.8%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	10/21/93	7	7.0	7.0	0.8%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	10/14/93	11	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41D	10/3/93	8	6.5	6.5	-0.4%	106.0	106.0	0.8%	118.0	118.0	0.4%	
7-41D	9/25/93	7	7.0	7.0	0.0%	105.0	105.0	0.0%	117.5	117.5	0.0%	
7-41D	9/18/93	8	7.0	7.0	0.8%	105.0	105.0	-0.8%	117.5	117.5	-0.4%	
7-41D	9/10/93	7	6.0	6.0	-1.2%	106.0	106.0	0.4%	118.0	118.0	0.4%	

Intermediate Range Monitors			7-41A-F							CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data DNSCL ROD BLOCK	Initial Data DNSCL ROD BLOCK	Raw Drift Data DNSCL ROD BLOCK	Initial Data HI ROD BLOCK	Initial Data HI ROD BLOCK	Raw Drift Data HI ROD BLOCK	Initial Data HI HI SCRAM	Initial Data HI HI SCRAM	Raw Drift Data HI HI SCRAM	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41D	9/3/93	6	7.0	7.5	0.0%	105.5	105.5	-0.4%	117.5	117.5	-0.4%	Difference exists between As Found and As Left for Downscale Rod Block. Both values are within specification, but the As Left is actually farther out than the As Found. It is assumed that an adjustment was made to this setting, as shown.
7-41D	8/28/93	4	7.0	7.0	0.8%	106.0	106.0	0.4%	118.0	118.0	0.4%	
7-41D	8/24/93		6.0	6.0		105.5	105.5		117.5	117.5		
7-41E	5/12/01	5	9.0	9.0	0.4%	104.0	104.0	0.8%	115.0	115.0	-0.8%	
7-41E	5/7/01	8	8.5	8.5	0.0%	103.0	103.0	-1.2%	116.0	116.0	-0.4%	IRMs A, C, and E Tested
7-41E	4/29/01	5	8.5	8.5	-0.4%	104.5	104.5	0.8%	116.5	116.5	0.8%	
7-41E	4/24/01	35	6.0	9.0	-0.8%	105.0	103.5	-0.8%	118.0	115.5	0.0%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41E	3/20/01	187	7.0	7.0	0.8%	106.0	106.0	0.4%	118.0	118.0	0.0%	
7-41E	9/14/00	294	6.0	6.0	-0.8%	105.5	105.5	-0.4%	118.0	118.0	-0.8%	
7-41E	11/25/99	10	7.0	7.0	0.0%	106.0	106.0	0.0%	119.0	119.0	0.0%	
7-41E	11/15/99	12	7.0	7.0	0.8%	106.0	106.0	0.0%	119.0	119.0	0.8%	
7-41E	11/3/99	4	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41E	10/30/99	3	6.5	6.5	-0.4%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41E	10/27/99	376	7.0	7.0	0.4%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41E	10/16/98	128	6.5	6.5	-0.4%	106.0	106.0	-0.8%	119.0	119.0	0.8%	
7-41E	6/10/98	15	7.0	7.0	0.8%	107.0	107.0	0.8%	118.0	118.0	-0.8%	
7-41E	5/26/98	31	6.0	6.0	0.0%	106.0	106.0	0.0%	119.0	119.0	1.2%	
7-41E	4/25/98	7	6.0	6.0	-0.8%	106.0	106.0	-0.8%	117.5	117.5	-1.2%	
7-41E	4/18/98	23	7.0	7.0	0.4%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41E	3/26/98	5	6.5	6.5	0.4%	106.0	106.0	0.0%	118.0	118.0	-0.8%	
7-41E	3/21/98	4	6.0	6.0	-0.4%	106.0	106.0	-0.4%	119.0	119.0	0.8%	
7-41E	3/17/98	112	6.5	6.5	0.4%	106.5	106.5	0.0%	118.0	118.0	0.0%	
7-41E	11/25/97	89	6.0	6.0	-0.8%	106.5	106.5	0.4%	118.0	118.0	0.0%	
7-41E	8/28/97	108	7.0	7.0	0.8%	106.0	106.0	0.0%	118.0	118.0	-0.8%	Only IRMs A-E Tested.
7-41E	5/12/97	11	6.0	6.0	-0.8%	106.0	106.0	-0.8%	119.0	119.0	0.8%	
7-41E	5/1/97	6	7.0	7.0	0.4%	107.0	107.0	0.8%	118.0	118.0	-0.8%	
7-41E	4/25/97	182	6.5	6.5	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.0%	

Intermediate Range Monitors			7-41A-F								CALIBRATION FILE DRIFT ANALYSIS	
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	HI HI SCRAM	HI HI SCRAM	Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41E	10/25/96	7	7.0	7.0	0.4%	106.0	106.0	-0.4%	119.0	119.0	0.0%	
7-41E	10/18/96	6	6.5	6.5	0.4%	106.5	106.5	0.0%	119.0	119.0	0.0%	
7-41E	10/12/96	11	6.0	6.0	0.0%	106.5	106.5	0.4%	119.0	119.0	0.0%	
7-41E	10/1/96	24	6.0	6.0	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.4%	
7-41E	9/7/96	4	6.5	6.5	0.4%	106.0	106.0	0.0%	118.5	118.5	-0.4%	
7-41E	9/3/96	270	6.0	6.0	-0.4%	106.0	106.0	-0.4%	119.0	119.0	0.0%	
7-41E	12/8/95	223	6.5	6.5	0.0%	106.5	106.5	0.8%	119.0	119.0	0.4%	
7-41E	4/29/95	7	6.5	6.5	0.4%	105.5	105.5	-0.4%	118.5	118.5	0.4%	
7-41E	4/22/95	14	6.0	6.0	-0.4%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41E	4/8/95	14	6.5	6.5	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41E	3/25/95	7	6.5	6.5	-0.4%	106.0	106.0	-0.4%	118.0	118.0	-0.8%	
7-41E	3/18/95	3	7.0	7.0	0.4%	106.5	106.5	0.4%	119.0	119.0	0.0%	
7-41E	3/15/95	151	6.5	6.5	-0.4%	106.0	106.0	-0.8%	119.0	119.0	0.8%	
7-41E	10/15/94	1	7.0	7.0	0.8%	107.0	107.0	0.8%	118.0	118.0	0.0%	
7-41E	10/14/94	10	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	-0.8%	
7-41E	10/4/94	5	6.0	6.0	-0.4%	106.0	106.0	0.0%	119.0	119.0	0.8%	W.O. 94-3191-00 Written against IRM E due to upscale and downscale spikes during detector retract / inserts. No affect on calibration.
7-41E	9/29/94	172	6.5	6.5	-0.4%	106.0	106.0	-0.4%	118.0	118.0	-0.4%	
7-41E	4/10/94	113	7.0	7.0	0.8%	106.5	106.5	0.4%	118.5	118.5	-0.4%	W.O.R. 94-013662 generated on IRM E. Spurrious spikes and trips on Withdrawals and inserts of detector. (W. O. 94-003191-00)
7-41E	12/18/93	1	6.0	6.0	-0.8%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41E	12/17/93	10	7.0	7.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.0%	
7-41E	12/7/93	4	7.0	7.0	0.8%	106.0	106.0	-0.4%	119.0	119.0	0.8%	
7-41E	12/3/93	43	6.0	6.0	-0.8%	106.5	106.5	0.4%	118.0	118.0	-0.8%	
7-41E	10/21/93	7	7.0	7.0	0.8%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41E	10/14/93	11	6.0	6.0	-0.4%	107.0	107.0	0.4%	119.0	119.0	0.0%	
7-41E	10/3/93	7	6.5	6.5	-0.4%	107.5	106.5	1.2%	119.0	119.0	0.4%	AF Data for Hi Rod Block Out of Tolerance
7-41E	9/26/93	8	7.0	7.0	0.0%	106.0	106.0	-0.8%	118.5	118.5	-0.4%	Drawer was repaired per W. O. 93-07995-00; Voltage Preamp was replaced. Only IRM E tested.
7-41E	9/18/93	8	7.0	7.0	0.0%	107.0	107.0	0.4%	119.0	119.0	0.0%	

Intermediate Range Monitors			7-41A-F							CALIBRATION FILE		DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	HI HI SCRAM	HI HI SCRAM	Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41E	9/10/93	7	7.0	7.0	-0.4%	106.5	106.5	0.0%	119.0	119.0	0.4%	
7-41E	9/3/93	6	7.5	7.5	0.4%	106.5	106.5	-0.4%	118.5	118.5	0.0%	
7-41E	8/28/93	4	7.0	7.0	0.0%	107.0	107.0	0.0%	118.5	118.5	0.4%	
7-41E	8/24/93		7.0	7.0		107.0	107.0		118.0	118.0		
7-41F	5/12/01	3	9.0	9.0	0.0%	104.0	104.0	0.0%	115.0	115.0	-0.4%	
7-41F	5/9/01	10	9.0	9.0	0.0%	104.0	104.0	0.0%	115.5	115.5	-0.4%	IRMs B, D and F Tested.
7-41F	4/29/01	5	9.0	9.0	0.0%	104.0	104.0	0.4%	116.0	116.0	0.4%	
7-41F	4/24/01	35	6.0	9.0	0.0%	107.0	103.5	0.0%	118.0	115.5	-0.8%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41F	3/20/01	187	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41F	9/14/00	294	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41F	11/25/99	10	6.0	6.0	-0.8%	107.0	107.0	0.0%	119.0	119.0	-0.8%	
7-41F	11/15/99	12	7.0	7.0	0.8%	107.0	107.0	0.8%	120.0	120.0	1.6%	Setting for Hi Hi SCRAM is Out of Tolerance, but not Adjusted. IRM F was declared inop during this procedure for an inadvertent half-SCRAM when detector selected to withdraw. (W.O. 99-010749-00)
7-41F	11/3/99	4	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	0.0%	
7-41F	10/30/99	3	6.0	6.0	0.0%	106.0	106.0	0.0%	118.0	118.0	-0.8%	
7-41F	10/27/99	376	6.0	6.0	0.0%	106.0	106.0	0.0%	119.0	119.0	0.8%	
7-41F	10/16/98	128	6.0	6.0	-0.4%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41F	6/10/98	15	6.5	6.5	0.4%	107.0	107.0	0.8%	119.0	119.0	1.2%	
7-41F	5/26/98	31	6.0	6.0	0.0%	106.0	106.0	-0.8%	117.5	117.5	-1.2%	
7-41F	4/25/98	7	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	4/18/98	23	6.0	6.0	0.0%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41F	3/26/98	5	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41F	3/21/98	4	6.0	6.0	-0.4%	107.0	107.0	0.4%	119.0	119.0	0.8%	
7-41F	3/17/98	112	6.5	6.5	0.4%	106.5	106.5	0.4%	118.0	118.0	0.0%	
7-41F	11/25/97	197	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41F	5/12/97	11	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	5/1/97	6	6.0	6.0	0.0%	107.0	107.0	0.4%	119.0	119.0	0.0%	
7-41F	4/25/97	182	6.0	6.0	0.0%	106.5	106.5	-0.4%	119.0	119.0	0.0%	
7-41F	10/25/96	7	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	

Intermediate Range Monitors			7-41A-F								CALIBRATION FILE	DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
		(Days)	DNSCL ROD BLOCK	DNSCL ROD BLOCK	DNSCL ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI ROD BLOCK	HI HI SCRAM	Hi HI SCRAM	HI HI SCRAM	Tolerance = ± 0.75 / 125
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-125 Units
7-41F	10/18/96	6	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	10/12/96	11	6.0	6.0	-0.4%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	10/1/96	24	6.5	6.5	-0.4%	107.0	107.0	0.0%	119.0	119.0	0.4%	
7-41F	9/7/96	4	7.0	7.0	0.8%	107.0	107.0	0.8%	118.5	118.5	-0.4%	
7-41F	9/3/96	270	6.0	6.0	0.0%	106.0	106.0	-0.8%	119.0	119.0	0.0%	
7-41F	12/8/95	223	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.8%	
7-41F	4/29/95	7	6.0	6.0	0.0%	107.0	107.0	0.0%	118.0	118.0	-0.8%	
7-41F	4/22/95	14	6.0	6.0	-0.8%	107.0	107.0	0.8%	119.0	119.0	0.8%	
7-41F	4/8/95	14	7.0	7.0	0.8%	106.0	106.0	-0.8%	118.0	118.0	-0.8%	
7-41F	3/25/95	7	6.0	6.0	-0.4%	107.0	107.0	0.0%	119.0	119.0	0.4%	
7-41F	3/18/95	3	6.5	6.5	0.4%	107.0	107.0	0.0%	118.5	118.5	-0.4%	
7-41F	3/15/95	151	6.0	6.0	-0.8%	107.0	107.0	0.0%	119.0	119.0	0.8%	
7-41F	10/15/94	1	7.0	7.0	0.8%	107.0	107.0	0.4%	118.0	118.0	-0.4%	
7-41F	10/14/94	10	6.0	6.0	0.0%	106.5	106.5	-0.4%	118.5	118.5	-0.4%	
7-41F	10/4/94	5	6.0	6.0	0.0%	107.0	107.0	0.4%	119.0	119.0	0.8%	
7-41F	9/29/94	172	6.0	6.0	0.0%	106.5	106.5	0.4%	118.0	118.0	-0.4%	
7-41F	4/10/94	113	6.0	6.0	0.0%	106.0	106.0	-0.8%	118.5	118.5	-0.4%	
7-41F	12/18/93	1	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.8%	
7-41F	12/17/93	10	6.0	6.0	0.0%	107.0	107.0	0.0%	118.0	118.0	-0.8%	
7-41F	12/7/93	4	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	12/3/93	43	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	10/21/93	7	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.0%	
7-41F	10/14/93	11	6.0	6.0	0.0%	107.0	107.0	0.0%	119.0	119.0	0.4%	
7-41F	10/3/93	8	6.0	6.0	-0.8%	107.0	107.0	0.4%	118.5	118.5	0.0%	
7-41F	9/25/93	7	7.0	7.0	0.0%	106.5	106.5	0.0%	118.5	118.5	0.0%	
7-41F	9/18/93	8	7.0	7.0	0.8%	106.5	106.5	0.0%	118.5	118.5	-0.4%	
7-41F	9/10/93	7	6.0	6.0	-0.8%	106.5	106.5	0.4%	119.0	119.0	0.8%	
7-41F	9/3/93	6	7.0	7.0	0.0%	106.0	106.0	-0.8%	118.0	118.0	0.0%	
7-41F	8/28/93	4	7.0	7.0	0.4%	107.0	107.0	0.0%	118.0	118.0	0.0%	For IRM F, W.O. Request 9905 generated because detector would not withdraw. No effect on calibration.
7-41F	8/24/93		6.5	6.5		107.0	107.0		118.0	118.0		

		Date	Interval	% Span
Downscale Rod Block	COUNT	325	325	325
	AVG INTERVAL	.	52	52
Required Trip = 9.25 Units (dec)	AVERAGE	.	.	-0.0037%
Tolerance = ± 0.75 Units	STDEV	.	.	0.4237%
Range = 0 - 125 Units	VARIANCE	.	.	0.0018%
(Drift calculated based on % Span)	KURTOSIS	.	.	-0.113
	SKEWNESS	.	.	0.065
	MAXIMUM	.	376	0.8000%
	MINIMUM	.	1	-1.2000%
	95%/95% TIF	.	.	2.106
	STDEV x 95/95 TIF	.	.	0.8924%
	% OF ORIG CNT	.	.	100.00%
		Date	Interval	% Span
Hi Rod Block	COUNT	325	325	325
	AVG INTERVAL	.	52	52
Required Trip = 103.75 Units (dec)	AVERAGE	.	.	-0.0049%
Tolerance = ± 0.75 Units	STDEV	.	.	0.4848%
Range = 0 - 125 Units	VARIANCE	.	.	0.0024%
(Drift calculated based on % Span)	KURTOSIS	.	.	-0.015
	SKEWNESS	.	.	-0.133
	MAXIMUM	.	376	1.2000%
	MINIMUM	.	1	-1.6000%
	95%/95% TIF	.	.	2.106
	STDEV x 95/95 TIF	.	.	1.0210%
	% OF ORIG CNT	.	.	100.00%
		Date	Interval	% Span
Hi SCRAM	COUNT	325	325	325
	AVG INTERVAL	.	52	52
Required Trip = 115.75 Units (dec)	AVERAGE	.	.	-0.0135%
Tolerance = ± 0.75 Units	STDEV	.	.	0.4800%
Range = 0 - 125 Units	VARIANCE	.	.	0.0023%
(Drift calculated based on % Span)	KURTOSIS	.	.	0.072
	SKEWNESS	.	.	0.119
	MAXIMUM	.	376	1.6000%
	MINIMUM	.	1	-1.2000%
	95%/95% TIF	.	.	2.106
	STDEV x 95/95 TIF	.	.	1.0110%
	% OF ORIG CNT	.	.	100.00%

		Date	Interval	% Span
Combined Trip Circuits	COUNT	975	975	975
.	AVG INTERVAL	.	52	52
Required Trip = Various	AVERAGE	.	.	-0.0074%
Tolerance = ± 0.75 Units	STDEV	.	.	0.4647%
Range = 0 - 125 Units	VARIANCE	.	.	0.0022%
(Drift calculated based on % Span)	KURTOSIS	.	.	0.002
.	SKEWNESS	.	.	0.008
.	MAXIMUM	.	376	1.6000%
.	MINIMUM	.	1	-1.6000%
.	95%/95% TIF	.	.	2.040
.	STDEV x 95/95 TIF	.	.	0.9479%
.	% OF ORIG CNT	.	.	100.00%

t-Test: Two-Sample Assuming Unequal Variances						
Trip / Reset Test	Downscale Rod Block	Hi Rod Block	Hi Rod Block	Hi SCRAM	Downscale Rod Block	Hi SCRAM
Mean	-3.69231E-05	-4.92308E-05	-4.92308E-05	-0.000135385	-3.69231E-05	-0.000135385
Variance	1.79562E-05	2.35037E-05	2.35037E-05	2.30433E-05	1.79562E-05	2.30433E-05
Observations	325	325	325	325	325	325
Hypothesized Mean Difference	0		0		0	
df	637		648		638	
t Stat	0.034459118		0.227651286		0.277216442	
P(T<=t) one-tail	0.486260918		0.409994577		0.390851856	
t Critical one-tail	1.647249519		1.647208592		1.647244972	
P(T<=t) two-tail	0.972521837		0.819989155		0.781703711	
t Critical two-tail	1.963694558		1.963630893		1.963690011	

Intermediate Range Monitors				7-41A to F	CALIBRATION FILE		DRIFT ANALYSIS
				Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
			(Days)	Combined Group	Combined Group	Combined Group	Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41A	Rod Block Dwnscl	5/12/01	18	9.0	9.0	-0.40%	
7-41A	Rod Block Dwnscl	4/24/01	921	6.0	9.5	-0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41A	Rod Block Dwnscl	10/16/98	1043	6.5	6.5	0.40%	
7-41A	Rod Block Dwnscl	12/8/95	607	6.0	6.0	0.00%	
7-41A	Rod Block Dwnscl	4/10/94	229	7.0	6.0	0.40%	Difference exists between As Found and As Left for Downscale Rod Block. Both values are within specification, but the As Left is actually farther out than the As Found. Because values differ, assume that the setting was adjusted, as shown.
7-41A	Rod Block Dwnscl	8/24/93		6.5	6.5		
7-41A	Rod Block Hi	5/12/01	18	104.0	104.0	0.40%	
7-41A	Rod Block Hi	4/24/01	921	106.0	103.5	0.00%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41A	Rod Block Hi	10/16/98	1043	106.0	106.0	-0.80%	
7-41A	Rod Block Hi	12/8/95	836	107.0	107.0	0.00%	
7-41A	Rod Block Hi	8/24/93		107.0	107.0		
7-41A	SCRAM Hi	5/12/01	18	116.0	116.0	0.00%	

Intermediate Range Monitors				7-41A to F	CALIBRATION FILE		DRIFT ANALYSIS
			(Days)	Initial Data Combined Group	Initial Data Combined Group	Raw Drift Data Combined Group	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41A	SCRAM Hi	4/24/01	921	118.0	116.0	0.00%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41A	SCRAM Hi	10/16/98	1043	118.0	118.0	0.00%	
7-41A	SCRAM Hi	12/8/95	836	118.0	118.0	-0.80%	
7-41A	SCRAM Hi	8/24/93		119.0	119.0		
7-41B	Rod Block Dwnscl	5/12/01	18	9.0	9.0	-0.40%	
7-41B	Rod Block Dwnscl	4/24/01	921	6.0	9.5	0.00%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41B	Rod Block Dwnscl	10/16/98	1043	6.0	6.0	0.00%	
7-41B	Rod Block Dwnscl	12/8/95	836	6.0	6.0	0.00%	
7-41B	Rod Block Dwnscl	8/24/93		6.0	6.0		
7-41B	Rod Block Hi	5/12/01	18	104.0	104.0	0.40%	
7-41B	Rod Block Hi	4/24/01	921	106.5	103.5	0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41B	Rod Block Hi	10/16/98	1043	106.0	106.0	-0.80%	
7-41B	Rod Block Hi	12/8/95	836	107.0	107.0	0.00%	
7-41B	Rod Block Hi	8/24/93		107.0	107.0		
7-41B	SCRAM Hi	5/12/01	18	115.0	115.0	-0.40%	

Intermediate Range Monitors				7-41A to F	CALIBRATION FILE		DRIFT ANALYSIS
				Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
			(Days)	Combined Group	Combined Group	Combined Group	Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41B	SCRAM Hi	4/24/01	921	118.0	115.5	0.00%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41B	SCRAM Hi	10/16/98	1043	118.0	118.0	-0.80%	
7-41B	SCRAM Hi	12/8/95	836	119.0	119.0	0.00%	
7-41B	SCRAM Hi	8/24/93		119.0	119.0		
7-41C	Rod Block Dwnscl	5/12/01	18	9.0	9.0	0.00%	
7-41C	Rod Block Dwnscl	4/24/01	921	7.0	9.0	0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41C	Rod Block Dwnscl	10/16/98	1043	6.5	6.5	0.40%	
7-41C	Rod Block Dwnscl	12/8/95	836	6.0	6.0	0.00%	
7-41C	Rod Block Dwnscl	8/24/93		6.0	6.0		
7-41C	Rod Block Hi	5/12/01	18	104.0	104.0	0.00%	
7-41C	Rod Block Hi	4/24/01	921	105.0	104.0	-0.80%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41C	Rod Block Hi	10/16/98	1043	106.0	106.0	0.00%	
7-41C	Rod Block Hi	12/8/95	836	106.0	106.0	0.00%	
7-41C	Rod Block Hi	8/24/93		106.0	106.0		
7-41C	SCRAM Hi	5/12/01	18	115.0	115.0	-0.80%	

Intermediate Range Monitors				7-41A to F	CALIBRATION FILE		DRIFT ANALYSIS
			(Days)	Initial Data Combined Group	Initial Data Combined Group	Raw Drift Data Combined Group	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41C	SCRAM Hi	4/24/01	921	117.5	116.0	-0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41C	SCRAM Hi	10/16/98	1043	118.0	118.0	0.00%	
7-41C	SCRAM Hi	12/8/95	836	118.0	118.0	0.00%	
7-41C	SCRAM Hi	8/24/93		118.0	118.0		
7-41D	Rod Block Dwnscl	5/12/01	18	9.0	9.0	0.00%	
7-41D	Rod Block Dwnscl	4/24/01	921	6.0	9.0	-0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41D	Rod Block Dwnscl	10/16/98	1043	6.5	6.5	0.00%	
7-41D	Rod Block Dwnscl	12/8/95	826	6.5	6.5	-0.80%	
7-41D	Rod Block Dwnscl	9/3/93	10	7.0	7.5	0.80%	Difference exists between As Found and As Left for Downscale Rod Block. Both values are within specification, but the As Left is actually farther out than the As Found. It is assumed that an adjustment was made to this setting, as shown.
7-41D	Rod Block Dwnscl	8/24/93		6.0	6.0		
7-41D	Rod Block Hi	5/12/01	18	104.0	104.0	0.00%	

Intermediate Range Monitors				7-41A to F	CALIBRATION FILE		DRIFT ANALYSIS
				Initial Data	Initial Data	Raw Drift Data	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125
			(Days)	Combined Group	Combined Group	Combined Group	Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41D	Rod Block Hi	4/24/01	921	105.0	104.0	-0.80%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41D	Rod Block Hi	10/16/98	1043	106.0	106.0	0.00%	
7-41D	Rod Block Hi	12/8/95	836	106.0	106.0	0.40%	
7-41D	Rod Block Hi	8/24/93		105.5	105.5		
7-41D	SCRAM Hi	5/12/01	18	116.0	116.0	0.00%	
7-41D	SCRAM Hi	4/24/01	921	117.5	116.0	-0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41D	SCRAM Hi	10/16/98	1043	118.0	118.0	0.00%	
7-41D	SCRAM Hi	12/8/95	836	118.0	118.0	0.40%	
7-41D	SCRAM Hi	8/24/93		117.5	117.5		
7-41E	Rod Block Dwnscl	5/12/01	18	9.0	9.0	0.00%	
7-41E	Rod Block Dwnscl	4/24/01	921	6.0	9.0	-0.40%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41E	Rod Block Dwnscl	10/16/98	1043	6.5	6.5	0.00%	
7-41E	Rod Block Dwnscl	12/8/95	836	6.5	6.5	-0.40%	
7-41E	Rod Block Dwnscl	8/24/93		7.0	7.0		
7-41E	Rod Block Hi	5/12/01	18	104.0	104.0	0.40%	

Intermediate Range Monitors				7-41A to F		CALIBRATION FILE	DRIFT ANALYSIS
			(Days)	Initial Data Combined Group	Initial Data Combined Group	Raw Drift Data Combined Group	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41E	Rod Block Hi	4/24/01	921	105.0	103.5	-0.80%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41E	Rod Block Hi	10/16/98	1043	106.0	106.0	-0.40%	
7-41E	Rod Block Hi	12/8/95	796	106.5	106.5	0.00%	
7-41E	Rod Block Hi	10/3/93	40	107.5	106.5	0.40%	AF Data for Hi Rod Block Out of Tolerance
7-41E	Rod Block Hi	8/24/93		107.0	107.0		
7-41E	SCRAM Hi	5/12/01	18	115.0	115.0	-0.40%	
7-41E	SCRAM Hi	4/24/01	921	118.0	115.5	-0.80%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41E	SCRAM Hi	10/16/98	1043	119.0	119.0	0.00%	
7-41E	SCRAM Hi	12/8/95	836	119.0	119.0	0.80%	
7-41E	SCRAM Hi	8/24/93		118.0	118.0		
7-41F	Rod Block Dwnscl	5/12/01	18	9.0	9.0	0.00%	
7-41F	Rod Block Dwnscl	4/24/01	921	6.0	9.0	0.00%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41F	Rod Block Dwnscl	10/16/98	1043	6.0	6.0	0.00%	
7-41F	Rod Block Dwnscl	12/8/95	836	6.0	6.0	-0.40%	
7-41F	Rod Block Dwnscl	8/24/93		6.5	6.5		
7-41F	Rod Block Hi	5/12/01	18	104.0	104.0	0.40%	

Intermediate Range Monitors				7-41A to F	CALIBRATION FILE		DRIFT ANALYSIS
			(Days)	Initial Data Combined Group	Initial Data Combined Group	Raw Drift Data Combined Group	Dwnscl Rod Block = 9.25 / 125; Hi Rod Block = 103.75 / 125; Hi Hi SCRAM = 115.75 / 125 Tolerance = ± 0.75 / 125
Tag	Setpt Function	Date	Interval	As Found	As Left	% Span	Range = 0-125 Units
7-41F	Rod Block Hi	4/24/01	921	107.0	103.5	0.80%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41F	Rod Block Hi	10/16/98	1043	106.0	106.0	-0.80%	
7-41F	Rod Block Hi	12/8/95	836	107.0	107.0	0.00%	
7-41F	Rod Block Hi	8/24/93		107.0	107.0		
7-41F	SCRAM Hi	5/12/01	18	115.0	115.0	-0.40%	
7-41F	SCRAM Hi	4/24/01	921	118.0	115.5	0.00%	Setpoint Changes Implemented per W.O.'s 01-892-000, 01-893-000, 01-894-000. Old Settings: Dwnscl Rod Block = 6.75 / 125; Hi Rod Block = 106.25 / 125 and Hi Hi SCRAM = 118.25 / 125.
7-41F	SCRAM Hi	10/16/98	1043	118.0	118.0	-0.80%	
7-41F	SCRAM Hi	12/8/95	836	119.0	119.0	0.80%	
7-41F	SCRAM Hi	8/24/93		118.0	118.0		

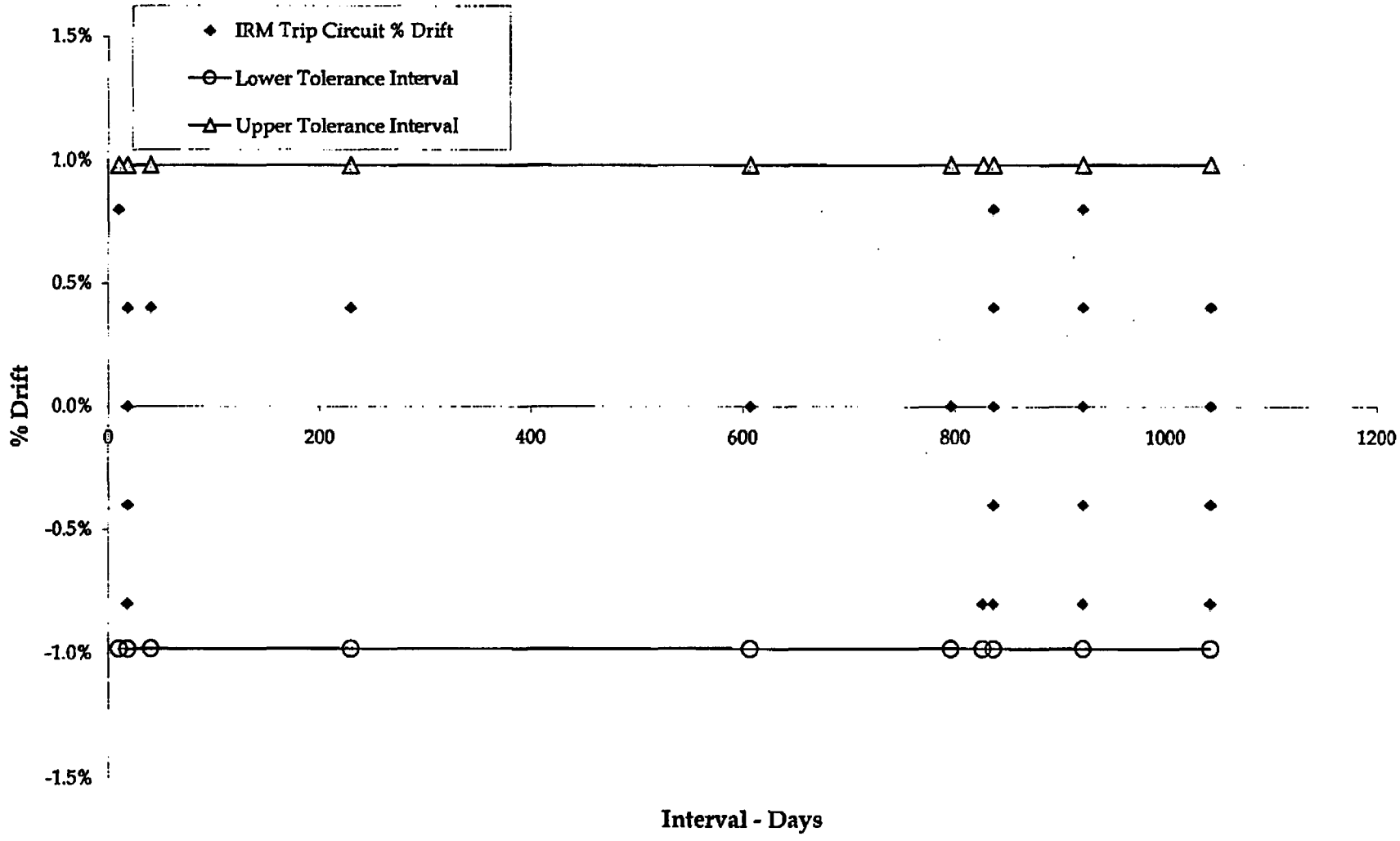
Combined Trip Circuit, Extended Int.	Tag	Date	Interval	% Span
	7-41A	05/12/01	18	-0.40%
	7-41A	04/24/01	921	-0.40%
	7-41A	10/16/98	1043	0.40%
	7-41A	12/08/95	607	0.00%
	7-41A	04/10/94	229	0.40%
	7-41A	05/12/01	18	0.40%
	7-41A	04/24/01	921	0.00%
	7-41A	10/16/98	1043	-0.80%
	7-41A	12/08/95	836	0.00%
	7-41A	05/12/01	18	0.00%
	7-41A	04/24/01	921	0.00%
	7-41A	10/16/98	1043	0.00%
	7-41A	12/08/95	836	-0.80%
	7-41B	05/12/01	18	-0.40%
	7-41B	04/24/01	921	0.00%
	7-41B	10/16/98	1043	0.00%
	7-41B	12/08/95	836	0.00%
	7-41B	05/12/01	18	0.40%
	7-41B	04/24/01	921	0.40%
	7-41B	10/16/98	1043	-0.80%
	7-41B	12/08/95	836	0.00%
	7-41B	05/12/01	18	-0.40%
	7-41B	04/24/01	921	0.00%
	7-41B	10/16/98	1043	-0.80%
	7-41B	12/08/95	836	0.00%
	7-41C	05/12/01	18	0.00%
	7-41C	04/24/01	921	0.40%
	7-41C	10/16/98	1043	0.40%
	7-41C	12/08/95	836	0.00%
	7-41C	05/12/01	18	0.00%
	7-41C	04/24/01	921	-0.80%
	7-41C	10/16/98	1043	0.00%
	7-41C	12/08/95	836	0.00%
	7-41C	05/12/01	18	-0.80%
	7-41C	04/24/01	921	-0.40%

Drift Calculation For Intermediat Range Monitors
IRM Trip Circuit Extended Interval Statistics and Outliers

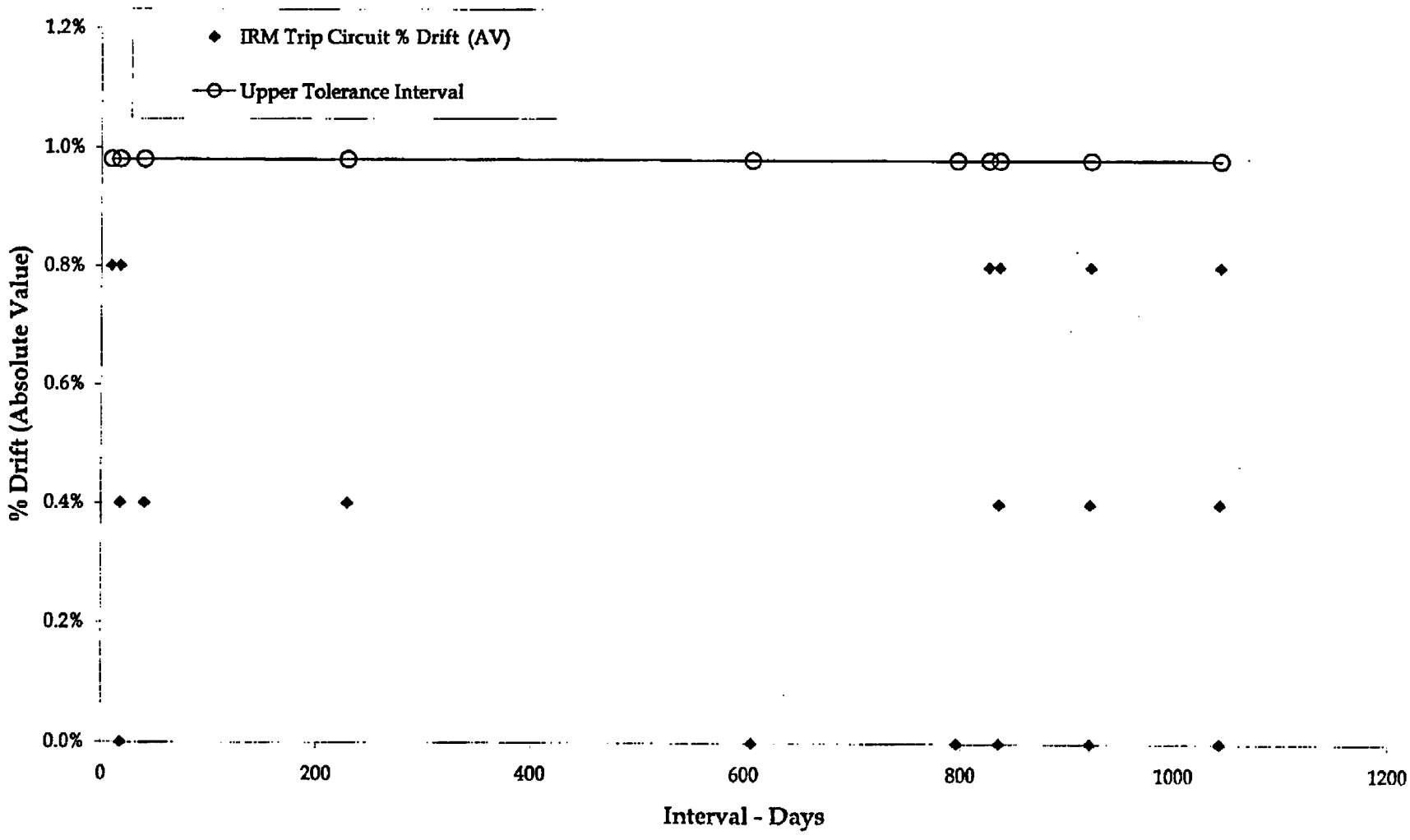
Combined Trip Circuit, Extended Int.	Tag	Date	Interval	% Span
	7-41C	10/16/98	1043	0.00%
	7-41C	12/08/95	836	0.00%
	7-41D	05/12/01	18	0.00%
	7-41D	04/24/01	921	-0.40%
	7-41D	10/16/98	1043	0.00%
	7-41D	12/08/95	826	-0.80%
	7-41D	09/03/93	10	0.80%
	7-41D	05/12/01	18	0.00%
	7-41D	04/24/01	921	-0.80%
	7-41D	10/16/98	1043	0.00%
	7-41D	12/08/95	836	0.40%
	7-41D	05/12/01	18	0.00%
	7-41D	04/24/01	921	-0.40%
	7-41D	10/16/98	1043	0.00%
	7-41D	12/08/95	836	0.40%
	7-41E	05/12/01	18	0.00%
	7-41E	04/24/01	921	-0.40%
	7-41E	10/16/98	1043	0.00%
	7-41E	12/08/95	836	-0.40%
	7-41E	05/12/01	18	0.40%
	7-41E	04/24/01	921	-0.80%
	7-41E	10/16/98	1043	-0.40%
	7-41E	12/08/95	796	0.00%
	7-41E	10/03/93	40	0.40%
	7-41E	05/12/01	18	-0.40%
	7-41E	04/24/01	921	-0.80%
	7-41E	10/16/98	1043	0.00%
	7-41E	12/08/95	836	0.80%
	7-41F	05/12/01	18	0.00%
	7-41F	04/24/01	921	0.00%
	7-41F	10/16/98	1043	0.00%
	7-41F	12/08/95	836	-0.40%
	7-41F	05/12/01	18	0.40%
	7-41F	04/24/01	921	0.80%
	7-41F	10/16/98	1043	-0.80%

Combined Trip Circuit, Extended Int.	Tag	Date	Interval	% Span
	7-41F	12/08/95	836	0.00%
	7-41F	05/12/01	18	-0.40%
	7-41F	04/24/01	921	0.00%
	7-41F	10/16/98	1043	-0.80%
	7-41F	12/08/95	836	0.80%
Combined Trip Circuit, Extended Int.	COUNT	75	75	75
	AVG INTERVAL	.	676	676
Required Trip = Various	AVERAGE	.	.	-0.0907%
Tolerance = ± 0.75 Units	STDEV	.	.	0.4291%
Range = 0 - 125 Units	VARIANCE	.	.	0.0018%
(Drift calculated based on % Span)	KURTOSIS	.	.	-0.370
	SKEWNESS	.	.	-0.070
	MAXIMUM	.	1043	0.8000%
	MINIMUM	.	10	-0.8000%
	95%/95% TIF	.	.	2.285
	STDEV x 95/95 TIF	.	.	0.9804%
	% OF ORIG CNT	.	.	100.00%
Crit T	.	.	.	3.100
Max Pt	.	.	.	1.4208%
Outlier Equation				
Max Pt = Absolute Value(Average)+Absolute Value(Stdev x Crit T)				
= Statistical Outliers				
= Data excluded as Outlier				

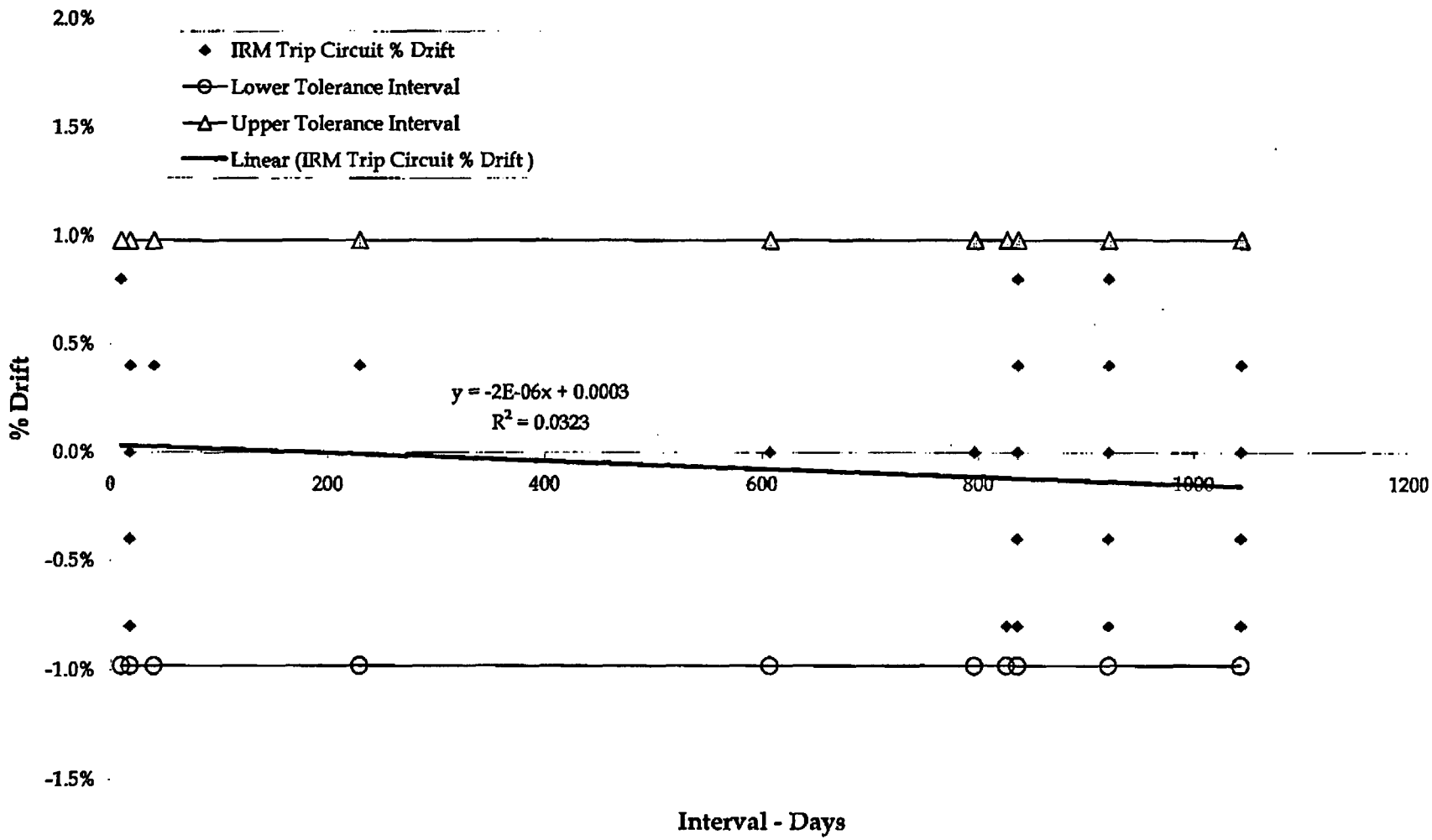
XY Scatter (Raw Data) - IRM Trip Circuit Drift



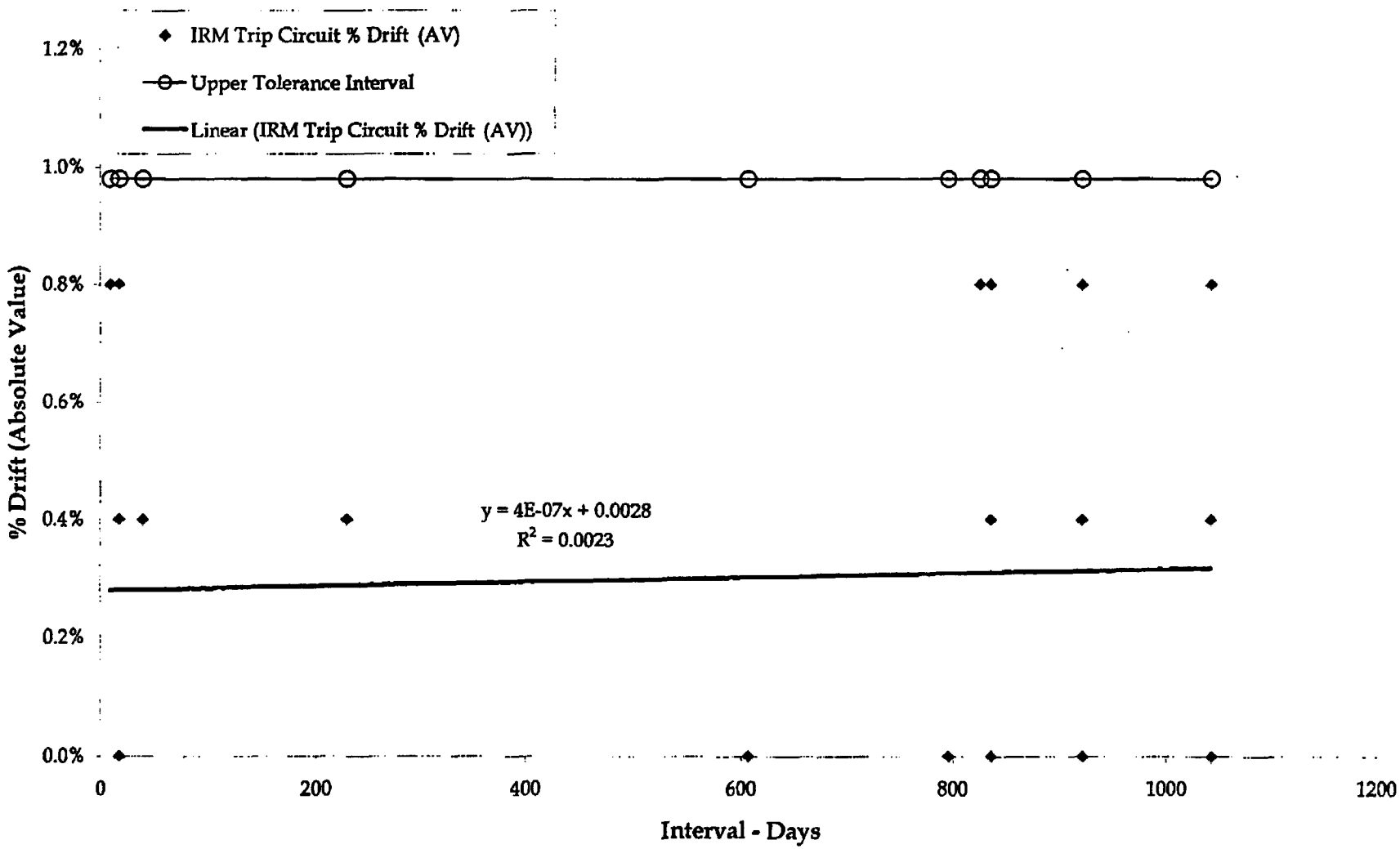
XY Scatter (Absolute Value) - IRM Trip Circuit Drift

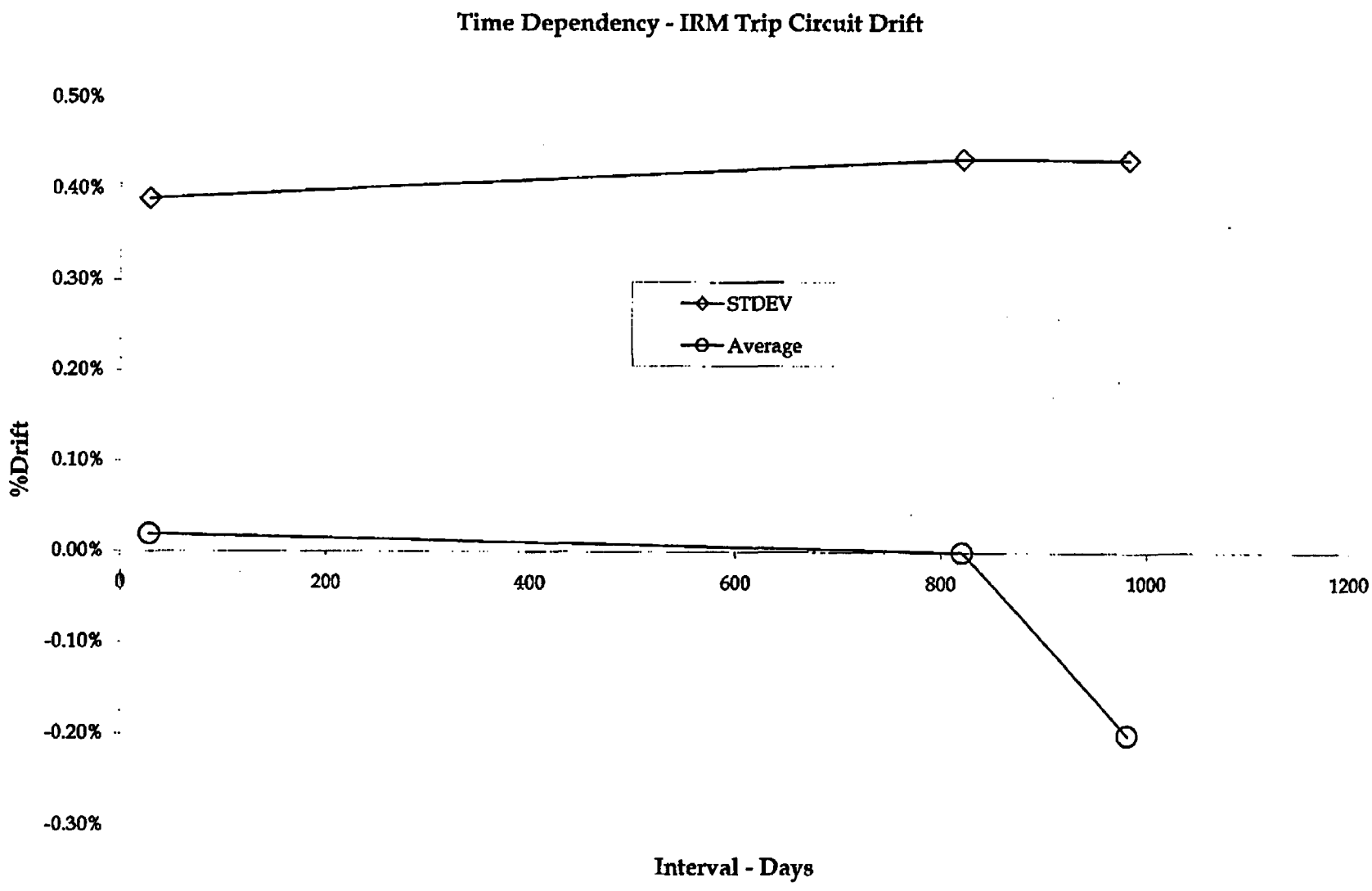


Regression Line (Raw Data) - IRM Trip Circuit Drift

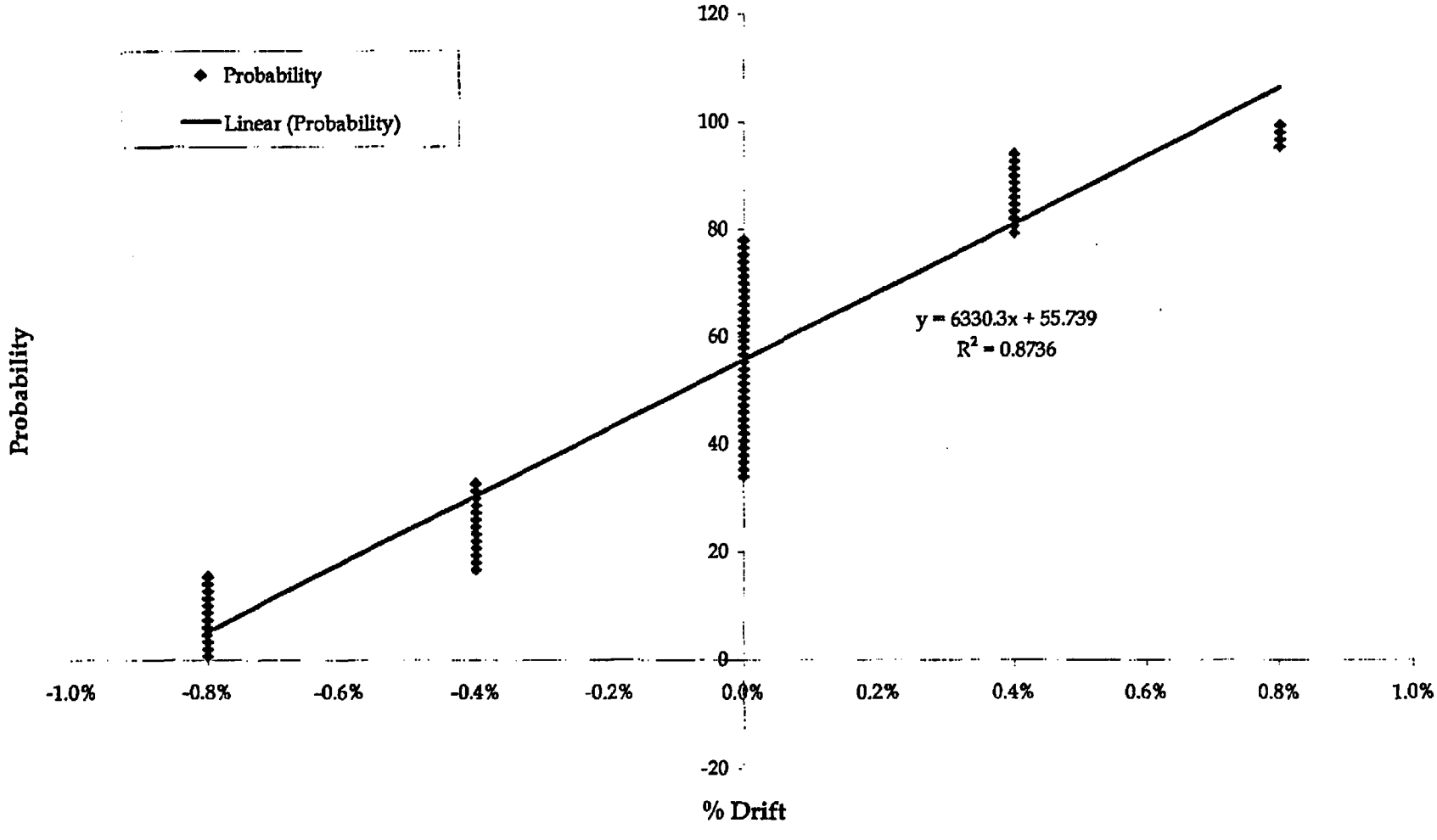


Regression Line (Absolute Value) - IRM Trip Circuit Drift

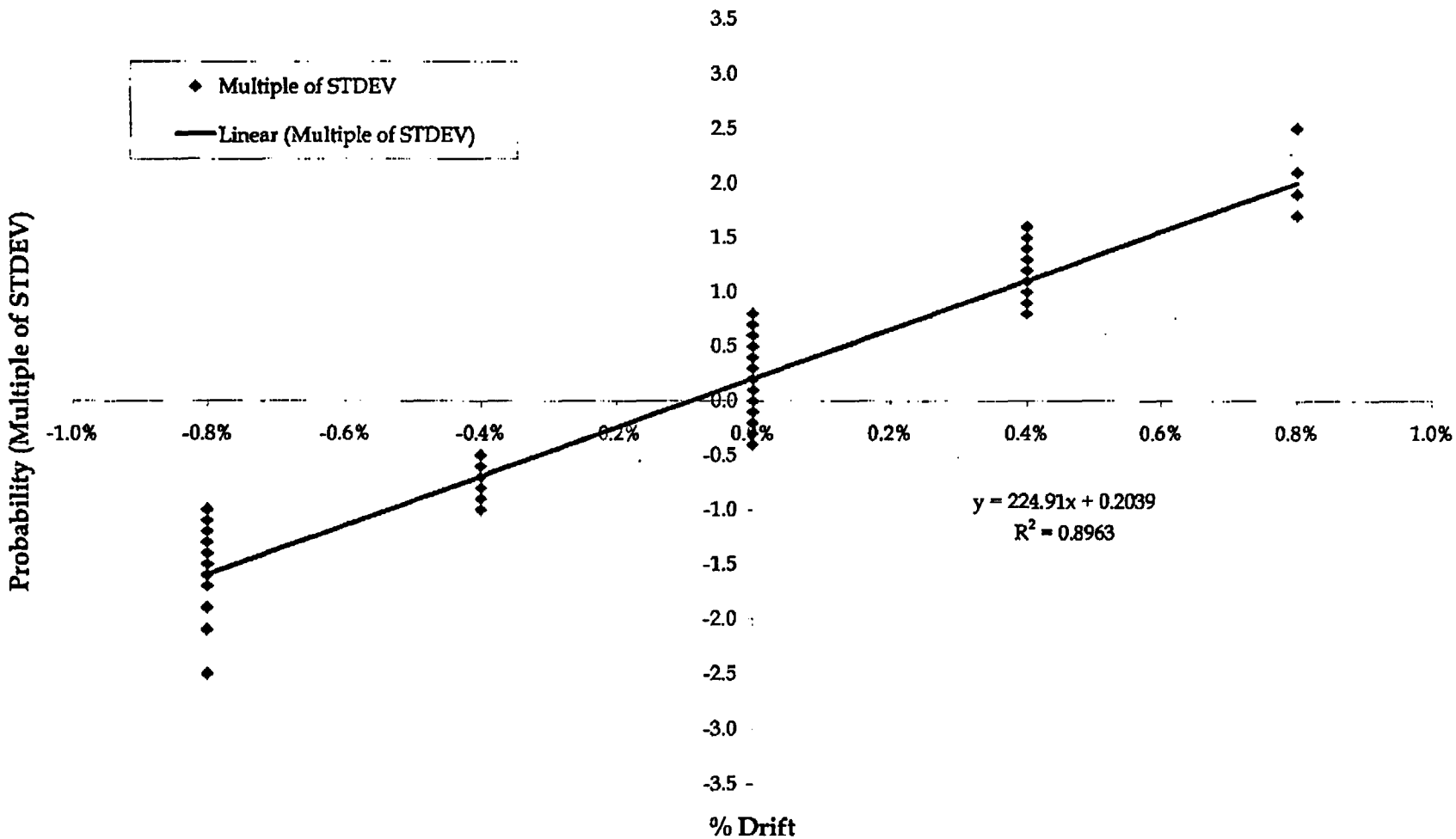



Time Dependency - IRM Trip Circuit Drift
0.50%
0.40%
0.30%
0.20%
0.10%
0.00%
-0.10%
-0.20%
-0.30%
%Drift
0
200
400
600
800
1000
1200
STDEV
Average
Interval - Days

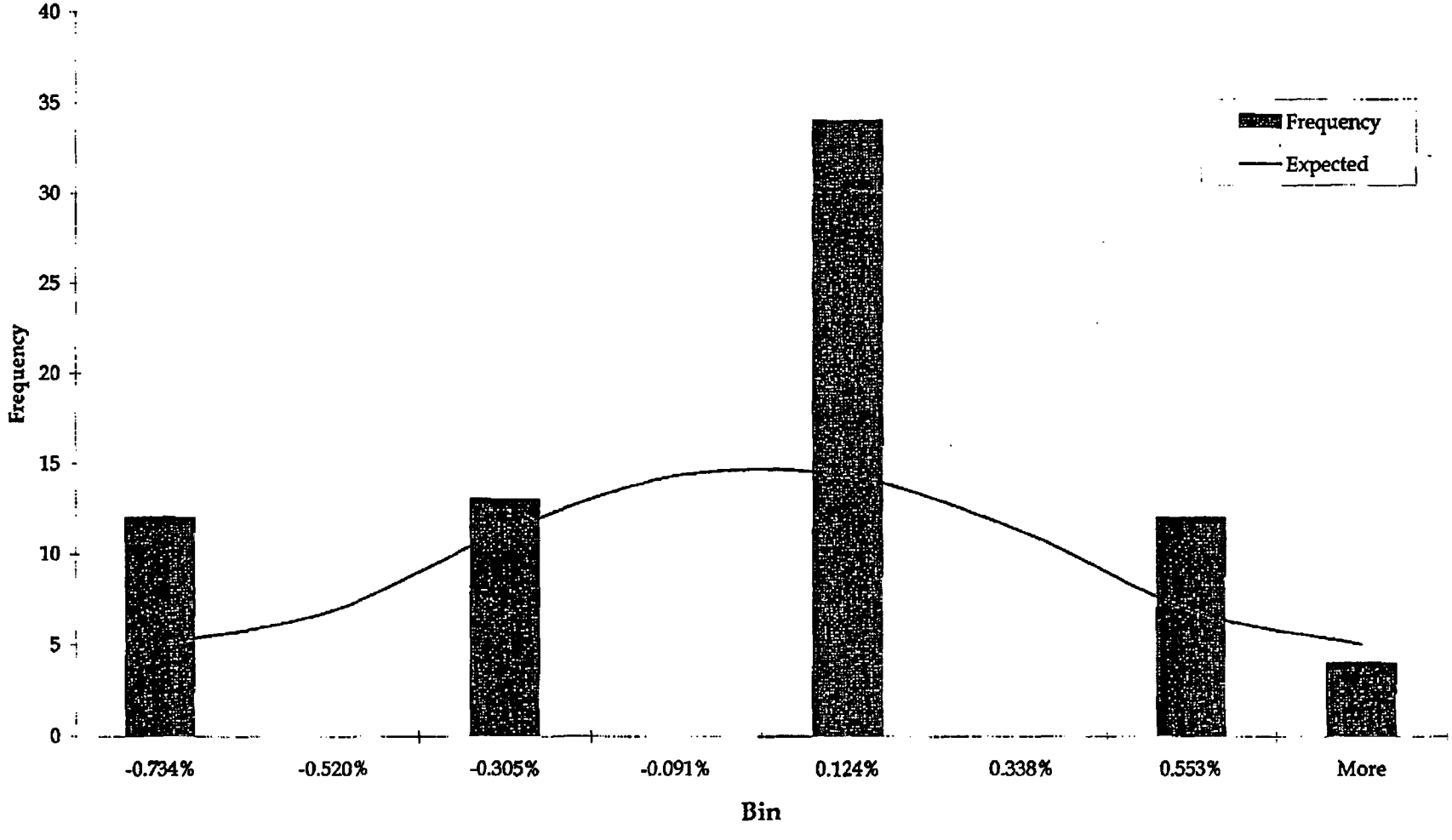
Cumulative Probability Plot - IRM Trip Circuit Drift



Normalized Probability Plot - IRM Trip Circuit Drift



Histogram - IRM Trip Circuit Drift



STDEV			
Count	75	47	71
STDEV	0.429%	1 STDEV %	2 STDEV %
Average	-0.091%	62.67%	94.67%
1 STDEV Range	-0.520%	0.338%	.
2 STDEV Range	-0.949%	0.767%	.
	.	.	.
	Normal Distribution	IRM Trip Circuit % Drift	.
1 Standard Deviation	68.27%	62.67%	.
2 Standard Deviations	95.45%	94.67%	.
MEAN BIAS			
Calibration Point	IRM Trip Circuit % Drift		
Count	75		
Average (Absoulute Value)	0.0907%		
Standard Deviation	0.4291%		
Absolute Value of Maximum Allowed Average	0.098%		
Mean Bias	No		

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41A	5/12/2001	5	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0200%	
7-41A	5/7/2001	8	0.00100	0.00100	0.0000%	-0.00100	-0.00100	-0.0200%	IRMs A, C, and E Tested
7-41A	4/29/2001	5	0.00100	0.00100	0.0100%	0.00100	0.00100	0.0100%	
7-41A	4/24/2001	35	0.00100	0.00000	-0.0026%	0.00100	0.00000	0.0100%	
7-41A	3/20/2001	187	0.00126	0.00126	0.0126%	0.00000	0.00000	0.0000%	
7-41A	9/14/2000	290	0.00000	0.00000	-0.0120%	0.00000	0.00000	0.0050%	
7-41A	11/29/1999	4	0.00120	0.00120	-0.0010%	-0.00050	-0.00050	0.0060%	Only IRM A Checked
7-41A	11/25/1999	10	0.00130	0.00130	0.0000%	-0.00110	-0.00110	-0.0140%	
7-41A	11/15/1999	12	0.00130	0.00130	0.0010%	0.00030	0.00030	0.0240%	
7-41A	11/3/1999	4	0.00120	0.00120	-0.0010%	-0.00210	-0.00210	-0.0070%	
7-41A	10/30/1999	3	0.00130	0.00130	0.0030%	-0.00140	-0.00140	0.0060%	
7-41A	10/27/1999	376	0.00100	0.00100	0.0000%	-0.00200	-0.00200	0.0000%	
7-41A	10/16/1998	128	0.00100	0.00100	-0.0020%	-0.00200	-0.00200	-0.0060%	
7-41A	6/10/1998	15	0.00120	0.00120	0.0000%	-0.00140	-0.00140	0.0060%	
7-41A	5/26/1998	31	0.00120	0.00120	0.0020%	-0.00200	-0.00200	-0.0100%	
7-41A	4/25/1998	7	0.00100	0.00100	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41A	4/18/1998	23	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	3/26/1998	5	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	3/21/1998	4	0.00100	0.00100	0.0100%	0.00000	0.00000	0.0000%	
7-41A	3/17/1998	112	0.00000	0.00000	-0.0100%	0.00000	0.00000	0.0100%	
7-41A	11/25/1997	89	0.00100	0.00100	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41A	8/28/1997	108	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	Only IRMs A-E Tested.
7-41A	5/12/1997	11	0.00100	0.00100	-0.0020%	0.00000	0.00000	0.0090%	
7-41A	5/1/1997	6	0.00120	0.00120	0.0020%	-0.00090	-0.00090	-0.0090%	
7-41A	4/25/1997	182	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	10/25/1996	7	0.00100	0.00100	-0.0020%	0.00000	0.00000	0.0100%	
7-41A	10/18/1996	6	0.00120	0.00120	0.0020%	-0.00100	-0.00100	-0.0100%	For the Z-14 AF/AL Readings, mV was not noted. It was noted on the values above it on AR-15. In addition, the device was not adjusted, and in order for this to happen, the value must have been in tolerance. Therefore, these readings were interpreted to be mV.
7-41A	10/12/1996	11	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0100%	

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41A	10/1/1996	24	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0100%	
7-41A	9/7/1996	4	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	9/3/1996	270	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	12/8/1995	223	0.00100	0.00100	0.0200%	0.00000	0.00000	0.0000%	
7-41A	4/29/1995	7	-0.00100	-0.00100	-0.0200%	0.00000	0.00000	0.0000%	
7-41A	4/22/1995	14	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0100%	
7-41A	4/8/1995	14	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0100%	
7-41A	3/25/1995	7	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0100%	
7-41A	3/18/1995	3	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0000%	
7-41A	3/15/1995	151	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0100%	
7-41A	10/15/1994	1	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	10/14/1994	10	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0100%	
7-41A	10/4/1994	5	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0100%	
7-41A	9/29/1994	172	0.00100	0.00100	0.0100%	0.00000	0.00000	0.0000%	
7-41A	4/10/1994	113	0.00000	0.00000	0.0000%	0.00000	0.00000	-0.1000%	
7-41A	12/18/1993	1	0.00000	0.00000	-0.0100%	0.01000	0.01000	0.1000%	
7-41A	12/17/1993	10	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0100%	
7-41A	12/7/1993	4	0.00100	0.00100	0.0000%	0.00000	0.00100	-0.0100%	
7-41A	12/3/1993	43	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0100%	
7-41A	10/21/1993	7	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	10/14/1993	11	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0100%	
7-41A	10/3/1993	8	0.00100	0.00100	0.0000%	0.00100	0.00100	0.0100%	
7-41A	9/25/1993	7	0.00100	0.00100	0.0000%	0.00000	0.00000	-0.0060%	
7-41A	9/18/1993	8	0.00100	0.00100	0.0000%	0.00060	0.00060	-0.0040%	
7-41A	9/10/1993	7	0.00100	0.00100	0.0100%	0.00100	0.00100	0.0100%	
7-41A	9/3/1993	6	0.00000	0.00000	-0.0100%	0.00000	0.00000	0.0000%	
7-41A	8/28/1993	4	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41A	8/24/1993		0.00100	0.00100		0.00000	0.00000		
7-41B	5/12/2001	3	0.00400	0.00400	0.0040%	0.00900	0.00900	0.0220%	
7-41B	5/9/2001	10	0.00360	0.00360	0.0360%	0.00680	0.00680	0.0480%	IRMs B, D and F Tested.
7-41B	4/29/2001	5	0.00000	0.00000	-0.0100%	0.00200	0.00200	-0.0500%	
7-41B	4/24/2001	35	0.00100	0.00100	0.0140%	0.00700	0.00700	0.1100%	
7-41B	3/20/2001	187	-0.01370	-0.00040	-0.1470%	-0.00400	-0.00400	-0.0500%	AF Data Out of Tolerance
7-41B	9/14/2000	294	0.00100	0.00100	-0.0050%	0.00100	0.00100	0.0070%	
7-41B	11/25/1999	10	0.00150	0.00150	-0.0340%	-0.01600	0.00030	-0.0880%	AF Data Out of Tolerance

Intermediate Range Monitors			7-41A-F					CALIBRATION FILE	DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41B	11/15/1999	12	0.00490	0.00490	-0.0170%	-0.00720	-0.00720	-0.0500%	
7-41B	11/3/1999	4	0.00660	0.00660	-0.0030%	-0.00220	-0.00220	-0.0080%	
7-41B	10/30/1999	3	0.00690	0.00690	-0.0010%	-0.00140	-0.00140	-0.0040%	
7-41B	10/27/1999	376	0.00700	0.00700	0.0000%	-0.00100	-0.00100	-0.0320%	
7-41B	10/16/1998	128	0.00700	0.00700	0.0560%	0.02000	0.00220	0.1680%	AF Data Out of Tolerance
7-41B	6/10/1998	15	0.00140	0.00140	0.0074%	0.00320	0.00320	0.0300%	
7-41B	5/26/1998	31	0.00066	0.00066	0.0396%	0.01390	0.00020	0.1090%	AF Data Out of Tolerance
7-41B	4/25/1998	7	-0.00330	-0.00330	-0.0030%	0.00300	0.00300	0.0000%	
7-41B	4/18/1998	23	-0.00300	-0.00300	0.0200%	0.00300	0.00300	0.0500%	
7-41B	3/26/1998	5	-0.00500	-0.00500	0.0000%	-0.00200	-0.00200	-0.0200%	
7-41B	3/21/1998	4	-0.00500	-0.00500	-0.0500%	-0.01500	0.00000	-0.2500%	AF Data Out of Tolerance
7-41B	3/17/1998	112	0.00000	0.00000	-0.0100%	0.01000	0.01000	0.0900%	
7-41B	11/25/1997	89	0.00100	0.00100	0.0100%	0.00100	0.00100	0.0000%	
7-41B	8/28/1997	108	0.01100	0.00000	0.1100%	0.03300	0.00100	0.3000%	Only IRMs A-E Tested. As Found Data Out of Tolerance.
7-41B	5/12/1997	11	0.00000	0.00000	0.0000%	0.00300	0.00300	0.0300%	
7-41B	5/1/1997	6	0.00000	0.00000	0.0100%	0.00000	0.00000	0.0000%	
7-41B	4/25/1997	182	-0.01100	-0.00100	-0.1200%	-0.01100	0.00000	-0.0600%	AF Data Out of Tolerance
7-41B	10/25/1996	7	0.00100	0.00100	0.0000%	-0.00500	-0.00500	0.0000%	
7-41B	10/18/1996	6	0.00100	0.00100	-0.0100%	-0.00500	-0.00500	-0.0100%	
7-41B	10/12/1996	11	0.00200	0.00200	-0.0100%	-0.00400	-0.00400	-0.0400%	
7-41B	10/1/1996	24	0.00300	0.00300	0.0000%	0.00000	0.00000	0.0000%	
7-41B	9/7/1996	4	0.00300	0.00300	-0.0030%	0.00000	0.00000	0.0020%	
7-41B	9/3/1996	270	0.00330	0.00330	0.0530%	0.02440	-0.00020	0.1740%	AF Data Out of Tolerance
7-41B	12/8/1995	223	-0.00200	-0.00200	0.0400%	0.00700	0.00700	0.1000%	
7-41B	4/29/1995	7	-0.00600	-0.00600	0.0000%	-0.00300	-0.00300	-0.0100%	
7-41B	4/22/1995	14	-0.00600	-0.00600	-0.0700%	-0.00200	-0.00200	-0.0300%	
7-41B	4/8/1995	14	0.00100	0.00100	0.0700%	0.00100	0.00100	0.0400%	
7-41B	3/25/1995	7	-0.00600	-0.00600	-0.0100%	-0.00300	-0.00300	-0.0260%	
7-41B	3/18/1995	3	-0.00500	-0.00500	0.0000%	-0.00040	-0.00040	-0.0040%	
7-41B	3/15/1995	151	-0.00500	-0.00500	-0.0700%	-0.02700	0.00000	-0.3200%	AF Data Out of Tolerance
7-41B	10/15/1994	1	0.00200	0.00200	0.0000%	0.00500	0.00500	0.0000%	
7-41B	10/14/1994	10	0.00200	0.00200	0.0000%	0.00500	0.00500	0.0900%	
7-41B	10/4/1994	5	0.00200	0.00200	-0.0100%	-0.00400	-0.00400	-0.0400%	
7-41B	9/29/1994	172	0.00300	0.00300	0.0700%	0.01900	0.00000	0.2000%	AF Data Out of Tolerance

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc.
		(Days)	AR-15	AR-15	AR-15	Z-14	Z-14	Z-14	Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41B	4/10/1994	113	-0.00400	-0.00400	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41B	12/18/1993	1	-0.00400	-0.00400	-0.0800%	0.00000	0.00000	0.0000%	
7-41B	12/17/1993	10	0.00400	0.00400	0.0700%	0.00000	0.00000	-0.0100%	
7-41B	12/7/1993	4	-0.00300	-0.00300	0.0000%	0.00100	0.00100	0.0000%	
7-41B	12/3/1993	43	-0.00300	-0.00300	-0.0400%	-0.01300	0.00100	-0.1300%	AF Data Out of Tolerance
7-41B	10/21/1993	7	0.00100	0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41B	10/14/1993	11	0.00100	0.00100	-0.0100%	-0.01100	0.00000	-0.0400%	AF Data Out of Tolerance
7-41B	10/3/1993	8	0.00200	0.00200	-0.0200%	-0.00700	-0.00700	-0.1000%	
7-41B	9/25/1993	7	0.00400	0.00400	0.0000%	0.00300	0.00300	0.0500%	
7-41B	9/18/1993	8	0.00400	0.00400	0.0000%	-0.00200	-0.00200	0.0100%	
7-41B	9/10/1993	7	0.00400	0.00400	0.0100%	-0.00300	-0.00300	0.0300%	
7-41B	9/3/1993	6	0.01000	0.00300	0.0100%	-0.01700	-0.00600	-0.1700%	AF Data Out of Tolerance
7-41B	8/28/1993	4	0.00900	0.00900	0.0000%	0.00000	0.00000	0.0000%	
7-41B	8/24/1993		0.00900	0.00900		0.03800	0.00000		AF Data Out of Tolerance
7-41C	5/12/2001	5	0.0020000	0.0020000	0.0100%	0.0063000	0.0063000	0.0330%	
7-41C	5/7/2001	8	0.0010000	0.0010000	0.0100%	0.0030000	0.0030000	0.0300%	IRMs A, C, and E Tested
7-41C	4/29/2001	5	0.0000000	0.0000000	-0.0100%	0.0000000	0.0000000	-0.0300%	
7-41C	4/24/2001	35	0.0010000	0.0010000	0.0100%	0.0030000	0.0030000	0.0250%	
7-41C	3/20/2001	187	0.0000000	0.0000000	-0.0900%	-0.0260000	0.0005000	-0.2700%	AF Data Out of Tolerance
7-41C	9/14/2000	294	0.0090000	0.0090000	0.0130%	0.0010000	0.0010000	0.0550%	
7-41C	11/25/1999	10	0.0077000	0.0077000	-0.0040%	-0.0045000	-0.0045000	-0.0070%	
7-41C	11/15/1999	12	0.0081000	0.0081000	-0.0100%	-0.0038000	-0.0038000	-0.0310%	
7-41C	11/3/1999	4	0.0091000	0.0091000	0.0010%	-0.0007000	-0.0007000	-0.0070%	
7-41C	10/30/1999	3	0.0090000	0.0090000	0.0000%	0.0000000	0.0000000	0.0000%	
7-41C	10/27/1999	376	0.0090000	0.0090000	0.0000%	0.0000000	0.0000000	0.0000%	
7-41C	10/16/1998	128	0.0090000	0.0090000	0.0500%	0.0166000	0.0000000	0.1430%	AF Data Out of Tolerance
7-41C	6/10/1998	15	0.0040000	0.0040000	0.0100%	0.0023000	0.0023000	0.0200%	
7-41C	5/26/1998	31	0.0030000	0.0030000	0.0200%	0.0116000	0.0003000	0.0760%	AF Data Out of Tolerance
7-41C	4/25/1998	7	0.0010000	0.0010000	0.0100%	0.0040000	0.0040000	0.0100%	
7-41C	4/18/1998	23	0.0000000	0.0000000	0.0000%	0.0030000	0.0030000	0.0300%	
7-41C	3/26/1998	5	0.0000000	0.0000000	0.0000%	0.0000000	0.0000000	0.0000%	
7-41C	3/21/1998	4	0.0000000	0.0000000	0.0000%	-0.0200000	0.0000000	-0.2000%	AF Data Out of Tolerance
7-41C	3/17/1998	112	0.0000000	0.0000000	-0.0400%	0.0100000	0.0000000	0.1900%	
7-41C	11/25/1997	89	0.0040000	0.0040000	-0.0300%	-0.0090000	-0.0090000	-0.0900%	
7-41C	8/28/1997	108	0.0070000	0.0070000	0.0700%	0.0230000	0.0000000	0.2200%	Only IRMs A-E Tested.

Intermediate Range Monitors		7-41A-F						CALIBRATION FILE	DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41C	5/12/1997	11	0.0000000	0.0000000	0.0000%	0.0010000	0.0010000	0.0000%	
7-41C	5/1/1997	6	0.0000000	0.0000000	0.0000%	0.0010000	0.0010000	0.0100%	
7-41C	4/25/1997	182	0.0000000	0.0000000	-0.0800%	-0.0260000	0.0000000	-0.2600%	AF Data Out of Tolerance
7-41C	10/25/1996	7	0.0080000	0.0080000	-0.0100%	0.0000000	0.0000000	0.0100%	
7-41C	10/18/1996	6	0.0090000	0.0090000	0.0100%	-0.0010000	-0.0010000	0.0100%	
7-41C	10/12/1996	11	0.0080000	0.0080000	0.0000%	-0.0020000	-0.0020000	-0.0200%	
7-41C	10/1/1996	24	0.0080000	0.0080000	0.0000%	0.0000000	0.0000000	-0.0100%	
7-41C	9/7/1996	4	0.0080000	0.0080000	-0.0070%	0.0010000	0.0010000	0.0070%	
7-41C	9/3/1996	270	0.0087000	0.0087000	0.0370%	0.0174000	0.0003000	0.1140%	AF Data Out of Tolerance
7-41C	12/8/1995	223	0.0050000	0.0050000	0.0400%	0.0060000	0.0060000	0.1100%	
7-41C	4/29/1995	7	0.0010000	0.0010000	-0.0100%	-0.0050000	-0.0050000	-0.0200%	
7-41C	4/22/1995	14	0.0020000	0.0020000	0.0100%	-0.0030000	-0.0030000	-0.0600%	
7-41C	4/8/1995	14	0.0010000	0.0010000	-0.0100%	0.0030000	0.0030000	0.0500%	
7-41C	3/25/1995	7	0.0020000	0.0020000	0.0000%	-0.0020000	-0.0020000	-0.0200%	
7-41C	3/18/1995	3	0.0020000	0.0020000	-0.0100%	0.0000000	0.0000000	0.0000%	
7-41C	3/15/1995	151	0.0030000	0.0030000	-0.0400%	-0.0140000	0.0000000	-0.1400%	AF Data Out of Tolerance
7-41C	10/15/1994	1	0.0070000	0.0070000	0.0000%	0.0000000	0.0000000	-0.0100%	
7-41C	10/14/1994	10	0.0070000	0.0070000	0.0000%	0.0010000	0.0010000	0.0200%	
7-41C	10/4/1994	5	0.0070000	0.0070000	-0.0100%	-0.0010000	-0.0010000	-0.0100%	
7-41C	9/29/1994	172	0.0080000	0.0080000	0.0700%	0.0170000	0.0000000	0.1700%	AF Data Out of Tolerance
7-41C	4/10/1994	113	0.0010000	0.0010000	-0.0100%	-0.0110000	0.0000000	-0.0100%	AF Data Out of Tolerance
7-41C	12/18/1993	1	0.0020000	0.0020000	0.0000%	-0.0100000	-0.0100000	-0.2000%	
7-41C	12/17/1993	10	0.0020000	0.0020000	-0.0100%	0.0100000	0.0100000	0.1800%	
7-41C	12/7/1993	4	0.0030000	0.0030000	0.0000%	-0.0080000	-0.0080000	0.0100%	
7-41C	12/3/1993	43	0.0030000	0.0030000	-0.0300%	-0.0090000	-0.0090000	-0.0900%	
7-41C	10/21/1993	7	0.0060000	0.0060000	0.0000%	0.0000000	0.0000000	0.0000%	
7-41C	10/14/1993	11	0.0060000	0.0060000	-0.0100%	0.0000000	0.0000000	-0.0200%	
7-41C	10/3/1993	8	0.0070000	0.0070000	0.0000%	0.0020000	0.0020000	0.0000%	
7-41C	9/25/1993	7	0.0070000	0.0070000	0.0000%	0.0020000	0.0020000	-0.0100%	
7-41C	9/18/1993	8	0.0070000	0.0070000	0.0000%	0.0030000	0.0030000	0.0000%	
7-41C	9/10/1993	7	0.0070000	0.0070000	0.0600%	0.0030000	0.0030000	0.0300%	
7-41C	9/3/1993	6	0.0010000	0.0010000	-0.0500%	0.0000000	0.0000000	-0.0200%	
7-41C	8/28/1993	4	0.0060000	0.0060000	0.0000%	0.0020000	0.0020000	0.0100%	
7-41C	8/24/1993		0.0060000	0.0060000		0.0240000	0.0010000		AF Data Out of Tolerance
7-41D	5/12/2001	3	0.00000	0.00000	0.0400%	0.00500	0.00500		

Intermediate Range Monitors			7-41A-F					CALIBRATION FILE	DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc.
		(Days)	AR-15	AR-15	AR-15	Z-14	Z-14	Z-14	Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41D	5/9/2001	10	-0.00400	-0.00400	-0.0200%	0.00330	ILL	0.0230%	IRMs B, D and F Tested., AL Value for Z-14 Circuit is Illegible.
7-41D	4/29/2001	3	-0.00200	-0.00200	-0.0300%	0.00100	0.00100	-0.0100%	
7-41D	4/26/2001	2	0.00100	0.00100	0.0200%	0.00200	0.00200	0.0000%	Only IRM D Tested.
7-41D	4/24/2001	35	-0.00100	-0.00100	0.0083%	0.00200	0.00200	0.0190%	
7-41D	3/20/2001	187	-0.00183	-0.00183	-0.0883%	-0.02100	0.00010	-0.2500%	AF Data Out of Tolerance
7-41D	9/14/2000	294	0.00700	0.00700	0.0160%	0.00400	0.00400	0.0480%	
7-41D	11/25/1999	10	0.00540	0.00540	0.0000%	-0.00080	-0.00080	0.0020%	
7-41D	11/15/1999	12	0.00540	0.00540	-0.0080%	-0.00100	-0.00100	-0.0240%	
7-41D	11/3/1999	4	0.00620	0.00620	0.0020%	0.00140	0.00140	0.0040%	
7-41D	10/30/1999	3	0.00600	0.00600	0.0000%	0.00100	0.00100	-0.0100%	
7-41D	10/27/1999	376	0.00600	0.00600	0.0000%	0.00200	0.00200	0.0000%	
7-41D	10/16/1998	128	0.00600	0.00600	0.0360%	0.01950	0.00200	0.1210%	AF Data Out of Tolerance
7-41D	6/10/1998	15	0.00240	0.00240	0.0060%	0.00740	0.00740	0.0140%	
7-41D	5/26/1998	31	0.00180	0.00180	0.0180%	0.00600	0.00600	0.0570%	
7-41D	4/25/1998	7	0.00000	0.00000	-0.0020%	0.00000	0.00030	-0.0150%	Two Tests on this Date for IRM D. One was PMT for WO 98-03854-00, which was writtem because of inoperative transition for IRM D from range 9 to range 10. The other measurement was the normal calibration which detected this problem. The only difference in readings was in Z-14 Zero Setting. Used calibration for As Found and PMT for As Left. However, no adjustments were made in either procedure run.
7-41D	4/18/1998	23	0.00020	0.00020	0.0120%	0.00150	0.00150	0.0250%	
7-41D	3/26/1998	5	-0.00100	-0.00100	-0.0100%	-0.00100	-0.00100	-0.0100%	
7-41D	3/21/1998	4	0.00000	0.00000	0.0000%	-0.01500	0.00000	-0.0500%	AF Data Out of Tolerance
7-41D	3/17/1998	112	0.00000	0.00000	-0.0200%	-0.01000	-0.01000	-0.0500%	
7-41D	11/25/1997	89	0.00200	0.00200	-0.0300%	-0.00500	-0.00500	-0.0500%	
7-41D	8/28/1997	108	0.00500	0.00500	0.0600%	0.01900	0.00000	0.1800%	Only IRMs A-E Tested.
7-41D	5/12/1997	11	-0.00100	-0.00100	0.0000%	0.00100	0.00100	0.0200%	

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41D	5/1/1997	6	-0.00100	-0.00100	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41D	4/25/1997	182	-0.00100	-0.00100	-0.0700%	-0.01600	0.00000	-0.2100%	AF Data Out of Tolerance
7-41D	10/25/1996	7	0.00600	0.00600	0.0000%	0.00500	0.00500	0.0000%	
7-41D	10/18/1996	6	0.00600	0.00600	0.0000%	0.00500	0.00500	-0.0100%	
7-41D	10/12/1996	11	0.00600	0.00600	-0.0100%	0.00600	0.00600	-0.0200%	
7-41D	10/1/1996	24	0.00700	0.00700	0.0000%	0.00800	0.00800	0.0100%	
7-41D	9/7/1996	4	0.00700	0.00700	-0.0010%	0.00700	0.00700	-0.0150%	W. O. R. 25551 generated for IRM D. Spiking H1. Declared inop, and J1 signal connector was removed. No affect on calibration values.
7-41D	9/3/1996	270	0.00710	0.00710	0.0410%	0.00850	0.00850	0.1050%	
7-41D	12/8/1995	223	0.00300	0.00300	0.0300%	-0.00200	-0.00200	0.0700%	
7-41D	4/29/1995	7	0.00000	0.00000	-0.0100%	-0.00900	-0.00900	0.0000%	
7-41D	4/22/1995	14	0.00100	0.00100	0.0000%	-0.00900	-0.00900	-0.1800%	
7-41D	4/8/1995	14	0.00100	0.00100	0.0000%	0.00900	0.00900	0.1800%	
7-41D	3/25/1995	7	0.00100	0.00100	0.0000%	-0.00900	-0.00900	-0.0200%	
7-41D	3/18/1995	3	0.00100	0.00100	-0.0100%	-0.00700	-0.00700	0.0000%	
7-41D	3/15/1995	151	0.00200	0.00200	-0.0400%	-0.00700	-0.00700	-0.1300%	
7-41D	10/15/1994	1	0.00600	0.00600	0.0000%	0.00600	0.00600	0.0000%	
7-41D	10/14/1994	10	0.00600	0.00600	0.0000%	0.00600	0.00600	0.0000%	
7-41D	10/4/1994	5	0.00600	0.00600	-0.0100%	0.00600	0.00600	-0.0200%	
7-41D	9/29/1994	172	0.00700	0.00700	0.0500%	0.00800	0.00800	0.1400%	
7-41D	4/10/1994	113	0.00200	0.00200	0.0000%	-0.00600	-0.00600	-0.0100%	
7-41D	12/18/1993	1	0.00200	0.00200	0.0000%	-0.00500	-0.00500	-0.1000%	
7-41D	12/17/1993	10	0.00200	0.00200	-0.0100%	0.00500	0.00500	0.0900%	
7-41D	12/7/1993	4	0.00300	0.00300	0.0000%	-0.00400	-0.00400	0.0000%	
7-41D	12/3/1993	43	0.00300	0.00300	-0.0200%	-0.00400	-0.00400	-0.0700%	
7-41D	10/21/1993	7	0.00500	0.00500	0.0100%	0.00300	0.00300	0.0300%	
7-41D	10/14/1993	11	0.00400	0.00400	-0.0200%	0.00000	0.00000	-0.0400%	
7-41D	10/3/1993	8	0.00600	0.00600	0.0100%	0.00400	0.00400	0.0100%	
7-41D	9/25/1993	7	0.00500	0.00500	-0.0100%	0.00300	0.00300	-0.0300%	
7-41D	9/18/1993	8	0.00600	0.00600	0.0000%	0.00600	0.00600	0.0100%	
7-41D	9/10/1993	7	0.00600	0.00600	0.0000%	0.00500	0.00500	0.0100%	

Intermediate Range Monitors			7-41A-F			CALIBRATION FILE			DRIFT ANALYSIS
			Initial Data	Initial Data	Raw Drift Data	Initial Data	Initial Data	Raw Drift Data	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc.
		(Days)	AR-15	AR-15	AR-15	Z-14	Z-14	Z-14	Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41D	9/3/1993	6	0.00600	0.00600	0.0100%	0.00400	0.00400	0.0100%	
7-41D	8/28/1993	4	0.00500	0.00500	0.0000%	0.00300	0.00300	0.0100%	
7-41D	8/24/1993		0.00500	0.00500		0.02000	0.00200		
7-41E	5/12/2001	5	-0.00260	-0.00260	0.0040%	0.00390	0.00390	0.0090%	
7-41E	5/7/2001	8	-0.00300	-0.00300	0.0100%	0.00300	0.00300	0.0300%	IRMs A, C, and E Tested
7-41E	4/29/2001	5	-0.00400	-0.00400	-0.0700%	0.00000	0.00000	-0.0100%	
7-41E	4/24/2001	35	0.00300	0.00300	0.0700%	0.00100	0.00100	0.0070%	
7-41E	3/20/2001	187	-0.00400	-0.00400	-0.0700%	-0.01100	0.00030	-0.1800%	AF Data Out of Tolerance
7-41E	9/14/2000	294	0.00300	0.00300	0.0140%	0.00700	0.00700	0.0100%	
7-41E	11/25/1999	10	0.00160	0.00160	-0.0020%	0.00600	0.00600	-0.0040%	
7-41E	11/15/1999	12	0.00180	0.00180	-0.0030%	0.00640	0.00640	-0.0040%	
7-41E	11/3/1999	4	0.00210	0.00210	0.0010%	0.00680	0.00680	-0.0020%	
7-41E	10/30/1999	3	0.00200	0.00200	0.0000%	0.00700	0.00700	0.0000%	
7-41E	10/27/1999	376	0.00200	0.00200	0.0000%	0.00700	0.00700	-0.0100%	
7-41E	10/16/1998	128	0.00200	0.00200	0.0140%	0.00800	0.00800	0.0860%	
7-41E	6/10/1998	15	0.00060	0.00060	0.0180%	-0.00060	-0.00060	0.0130%	
7-41E	5/26/1998	31	-0.00120	-0.00120	0.0180%	-0.00190	-0.00190	0.0410%	
7-41E	4/25/1998	7	-0.00300	-0.00300	0.0000%	-0.00600	-0.00600	0.0000%	
7-41E	4/18/1998	23	-0.00300	-0.00300	0.0000%	-0.00600	-0.00600	0.0100%	
7-41E	3/26/1998	5	-0.00300	-0.00300	0.0000%	-0.00700	-0.00700	0.0000%	
7-41E	3/21/1998	4	-0.00300	-0.00300	-0.0300%	-0.00700	-0.00700	-0.0700%	
7-41E	3/17/1998	112	0.00000	0.00000	0.0100%	0.00000	0.00000	0.0000%	
7-41E	11/25/1997	89	-0.00100	-0.00100	-0.0300%	0.00000	0.00000	-0.0600%	
7-41E	8/28/1997	108	0.00200	0.00200	0.0500%	0.00600	0.00600	0.1200%	Only IRMs A-E Tested.
7-41E	5/12/1997	11	-0.00300	-0.00300	0.0000%	-0.00600	-0.00600	0.0000%	
7-41E	5/1/1997	6	-0.00300	-0.00300	0.0000%	-0.00600	-0.00600	0.0100%	
7-41E	4/25/1997	182	-0.00300	-0.00300	-0.0500%	-0.00700	-0.00700	-0.1500%	
7-41E	10/25/1996	7	0.00200	0.00200	0.0000%	0.00800	0.00800	-0.0100%	
7-41E	10/18/1996	6	0.00200	0.00200	-0.0100%	0.00900	0.00900	0.0000%	
7-41E	10/12/1996	11	0.00300	0.00300	0.0000%	0.00900	0.00900	-0.0100%	
7-41E	10/1/1996	24	0.00300	0.00300	0.0000%	0.01000	0.01000	0.0000%	
7-41E	9/7/1996	4	0.00300	0.00300	0.0010%	0.01000	0.01000	0.0050%	
7-41E	9/3/1996	270	0.00290	0.00290	0.0290%	0.00950	0.00950	0.0650%	
7-41E	12/8/1995	223	0.00000	0.00000	0.0200%	0.00300	0.00300	0.0500%	
7-41E	4/29/1995	7	-0.00200	-0.00200	-0.0100%	-0.00200	-0.00200	0.0000%	

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41E	4/22/1995	14	-0.00100	-0.00100	-0.0200%	-0.00200	-0.00200	-0.0300%	
7-41E	4/8/1995	14	0.00100	0.00100	0.0200%	0.00100	0.00100	0.0200%	
7-41E	3/25/1995	7	-0.00100	-0.00100	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41E	3/18/1995	3	-0.00100	-0.00100	0.0000%	0.00000	0.00000	0.0000%	
7-41E	3/15/1995	151	-0.00100	-0.00100	-0.0300%	-0.00900	0.00000	-0.0900%	AF Data Not Out of Tolerance, Even Though AF Differs from AL on Z-14 Zero Circuit.
7-41E	10/15/1994	1	0.00200	0.00200	0.0000%	0.00000	0.00000	-0.0400%	
7-41E	10/14/1994	10	0.00200	0.00200	0.0000%	0.00400	0.00400	0.0400%	
7-41E	10/4/1994	5	0.00200	0.00200	0.0000%	0.00000	0.00000	0.0000%	W.O. 94-3191-00 Written against IRM E due to upscale and downscale spikes during detector retract / inserts. No affect on calibration.
7-41E	9/29/1994	172	0.00200	0.00200	0.0300%	0.00000	0.00000	0.0900%	
7-41E	4/10/1994	113	-0.00100	-0.00100	-0.0100%	-0.00900	-0.00900	-0.0300%	W.O.R. 94-013662 generated on IRM E. Spurrious spikes and trips on Withdrawals and inserts of detector. (W. O. 94-003191-00) No affect on calibration.
7-41E	12/18/1993	1	0.00000	0.00000	0.0000%	-0.00600	-0.00600	-0.1200%	
7-41E	12/17/1993	10	0.00000	0.00000	0.0000%	0.00600	0.00600	0.1100%	
7-41E	12/7/1993	4	0.00000	0.00000	0.0000%	-0.00500	-0.00500	-0.0100%	
7-41E	12/3/1993	43	0.00000	0.00000	-0.0200%	-0.00400	-0.00400	-0.0300%	
7-41E	10/21/1993	7	0.00200	0.00200	0.0000%	-0.00100	-0.00100	0.0000%	
7-41E	10/14/1993	11	0.00200	0.00200	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41E	10/3/1993	7	0.00200	0.00200	0.0000%	0.00000	0.00000	0.0000%	
7-41E	9/26/1993	8	0.00200	0.00200	-0.0400%	New	0.00000		Drawer was repaired per W. O. 93-07995-00; Voltage Preamp was replaced. Only IRM E tested. AF Data for Z-14 Zero Circuit Out of Tolerance, Likely Due to PreAmp Replacement. AF Data is Excluded.
7-41E	9/18/1993	8	0.00600	0.00600	0.0000%	-0.00900	-0.00900	-0.0900%	
7-41E	9/10/1993	7	0.00600	0.00600	0.0200%	-0.01700	0.00000	-0.2600%	AF Data Out of Tolerance
7-41E	9/3/1993	6	0.00400	0.00400	0.0000%	0.00900	0.00900	0.0500%	

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41E	8/28/1993	4	0.00400	0.00400	0.0000%	0.00400	0.00400	0.0300%	
7-41E	8/24/1993		0.00430	0.00400		0.01200	0.00100		AF Data Out of Tolerance
7-41F	5/12/2001	3	0.00222	0.00222	0.0122%	0.00730	0.00730	0.0630%	
7-41F	5/9/2001	10	0.00100	0.00100	0.0100%	0.00100	0.00100	0.0100%	IRMs B, D and F Tested.
7-41F	4/29/2001	5	0.00000	0.00000	-0.0600%	0.00000	0.00000	-0.0270%	
7-41F	4/24/2001	35	0.00600	0.00600	0.0600%	0.00270	0.00270	0.0240%	
7-41F	3/20/2001	187	-0.01070	0.00000	-0.1170%	0.00030	0.00030	-0.0570%	AF Data Out of Tolerance
7-41F	9/14/2000	294	0.00100	0.00100	0.0250%	0.00600	0.00600	0.1100%	
7-41F	11/25/1999	10	-0.00150	-0.00150	0.0000%	-0.00500	-0.00500	-0.0110%	
7-41F	11/15/1999	12	-0.00150	-0.00150	-0.0130%	-0.00390	-0.00390	-0.0330%	
7-41F	11/3/1999	4	-0.00020	-0.00020	-0.0020%	-0.00060	-0.00060	-0.0160%	
7-41F	10/30/1999	3	0.00000	0.00000	0.0000%	0.00100	0.00100	0.0000%	
7-41F	10/27/1999	376	0.01050	0.00000	0.0050%	-0.02820	0.00100	-0.2920%	Both AF Data Out of Tolerance
7-41F	10/16/1998	128	0.01000	0.01000	0.0480%	0.01700	0.00100	0.1400%	AF Data Out of Tolerance
7-41F	6/10/1998	15	0.00520	0.00520	0.0088%	0.00300	0.00300	0.0253%	
7-41F	5/26/1998	31	0.00432	0.00432	0.0332%	0.01350	0.00047	0.0850%	AF Data Out of Tolerance
7-41F	4/25/1998	7	0.00100	0.00100	0.0000%	0.00500	0.00500	0.0100%	
7-41F	4/18/1998	23	0.00100	0.00100	0.0100%	0.00400	0.00400	0.0300%	
7-41F	3/26/1998	5	0.00000	0.00000	0.0000%	0.00100	0.00100	0.0100%	
7-41F	3/21/1998	4	0.00000	0.00000	0.0000%	0.01700	0.00000	0.1700%	AF Data Out of Tolerance
7-41F	3/17/1998	112	0.00000	0.00000	-0.0500%	0.00000	0.00000	0.0000%	
7-41F	11/25/1997	197	0.00500	0.00500	0.0500%	0.00000	0.00000	-0.0400%	
7-41F	5/12/1997	11	0.00000	0.00000	-0.0060%	0.00400	0.00400	0.0720%	
7-41F	5/1/1997	6	0.00060	0.00060	0.0060%	-0.00320	-0.00320	0.0180%	
7-41F	4/25/1997	182	-0.01000	0.00000	-0.1000%	-0.00500	-0.00500	-0.0100%	AF Data Barely In Tolerance & Adjusted
7-41F	10/25/1996	7	0.00000	0.00000	0.0000%	-0.00400	-0.00400	0.0000%	
7-41F	10/18/1996	6	0.00000	0.00000	-0.0100%	-0.00400	-0.00400	-0.0200%	
7-41F	10/12/1996	11	0.00100	0.00100	0.0000%	-0.00200	-0.00200	-0.0200%	
7-41F	10/1/1996	24	0.00100	0.00100	-0.0100%	0.00000	0.00000	-0.0100%	
7-41F	9/7/1996	4	0.00200	0.00200	0.0060%	0.00100	0.00100	0.0080%	
7-41F	9/3/1996	270	0.00140	0.00140	0.0440%	0.02100	0.00020	0.1500%	AF Data Out of Tolerance
7-41F	12/8/1995	223	-0.00300	-0.00300	0.0400%	0.00600	0.00600	0.0700%	
7-41F	4/29/1995	7	-0.00700	-0.00700	-0.0100%	-0.00100	-0.00100	-0.0100%	
7-41F	4/22/1995	14	-0.00600	-0.00600	0.0100%	0.00000	0.00000	0.0300%	

Intermediate Range Monitors			7-41A-F				CALIBRATION FILE		DRIFT ANALYSIS
		(Days)	Initial Data AR-15	Initial Data AR-15	Raw Drift Data AR-15	Initial Data Z-14	Initial Data Z-14	Raw Drift Data Z-14	The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc. Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	As Found	As Left	% Drift	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41F	4/8/1995	14	-0.00700	-0.00700	-0.0100%	-0.00300	-0.00300	-0.0200%	
7-41F	3/25/1995	7	-0.00600	-0.00600	0.0000%	-0.00100	-0.00100	-0.0100%	
7-41F	3/18/1995	3	-0.00600	-0.00600	0.0000%	0.00000	0.00000	0.0000%	
7-41F	3/15/1995	151	-0.00600	-0.00600	-0.0600%	-0.01700	0.00000	-0.1700%	AF Data Out of Tolerance
7-41F	10/15/1994	1	0.00000	0.00000	0.0000%	0.00000	0.00000	0.0000%	
7-41F	10/14/1994	10	0.00000	0.00000	0.0000%	0.00000	0.00000	-0.0100%	
7-41F	10/4/1994	5	0.00000	0.00000	0.0000%	0.00100	0.00100	-0.0200%	
7-41F	9/29/1994	172	0.00000	0.00000	0.0500%	0.01900	0.00300	0.2100%	AF Data Out of Tolerance
7-41F	4/10/1994	113	-0.00500	-0.00500	0.0000%	-0.00200	-0.00200	-0.0200%	
7-41F	12/18/1993	1	-0.00500	-0.00500	0.0000%	0.00000	0.00000	0.0000%	
7-41F	12/17/1993	10	-0.00500	-0.00500	0.0000%	0.00000	0.00000	-0.0100%	
7-41F	12/7/1993	4	-0.00500	-0.00500	-0.0100%	-0.01500	0.00100	-0.1300%	AF Data Out of Tolerance
7-41F	12/3/1993	43	-0.00400	-0.00400	-0.0200%	-0.00200	-0.00200	0.0300%	
7-41F	10/21/1993	7	-0.00200	-0.00200	0.0000%	-0.00500	-0.00500	0.0400%	
7-41F	10/14/1993	11	-0.00200	-0.00200	-0.0200%	-0.00900	-0.00900	-0.0700%	
7-41F	10/3/1993	8	0.00000	0.00000	0.0000%	-0.00200	-0.00200	-0.0200%	
7-41F	9/25/1993	7	0.00000	0.00000	0.0000%	0.00000	0.00000	0.0000%	
7-41F	9/18/1993	8	0.01100	0.00000	0.0100%	0.02300	0.00000	0.2000%	Both AF Data Out of Tolerance
7-41F	9/10/1993	7	0.01000	0.01000	0.0100%	0.00300	0.00300	0.0000%	
7-41F	9/3/1993	6	0.00900	0.00900	0.0000%	0.00300	0.00300	0.0200%	
7-41F	8/28/1993	4	0.00900	0.00900	0.0100%	0.00100	0.00100	0.0100%	For IRM F, W.O. Request 9905 generated because detector would not withdraw. No effect on calibration.
7-41F	8/24/1993		0.00800	0.00800		0.03800	0.00000		AF Data Out of Tolerance

		Date	Interval	% Span
AR-15 Zero Adjust	COUNT	325	325	325
.	AVG INTERVAL	.	52	52
Setting = 0 Vdc	AVERAGE	.	.	-0.0009%
Tolerance = ± 0.01 Vdc	STDEV	.	.	0.0280%
Range = 0 - 10 Vdc	VARIANCE	.	.	0.0000%
(Drift calculated based on % Span)	KURTOSIS	.	.	5.873
.	SKEWNESS	.	.	-0.929
.	MAXIMUM	.	376	0.1100%
.	MINIMUM	.	1	-0.1470%
.	95%/95% TIF	.	.	2.106
.	STDEV x 95/95 TIF	.	.	0.0591%
.	% OF ORIG CNT	.	.	100.00%
		Date	Interval	% Span
Z-14 Zero Adjust	COUNT	323	323	323
.	AVG INTERVAL	.	52	52
Setting = 0 Vdc	AVERAGE	.	.	0.0002%
Tolerance = ± 0.01 Vdc	STDEV	.	.	0.0763%
Range = 0 - 10 Vdc	VARIANCE	.	.	0.0001%
(Drift calculated based on % Span)	KURTOSIS	.	.	4.341
.	SKEWNESS	.	.	-0.523
.	MAXIMUM	.	376	0.3000%
.	MINIMUM	.	1	-0.3200%
.	95%/95% TIF	.	.	2.106
.	STDEV x 95/95 TIF	.	.	0.1608%
.	% OF ORIG CNT	.	.	100.00%
		Date	Interval	% Span
Combined Zero Circuits	COUNT	648	648	648
.	AVG INTERVAL	.	52	52
Setting = 0 Vdc	AVERAGE	.	.	-0.0003%
Tolerance = ± 0.01 Vdc	STDEV	.	.	0.0574%
Range = 0 - 10 Vdc	VARIANCE	.	.	0.0000%
(Drift calculated based on % Span)	KURTOSIS	.	.	8.584
.	SKEWNESS	.	.	-0.642
.	MAXIMUM	.	376	0.3000%
.	MINIMUM	.	1	-0.3200%
.	95%/95% TIF	.	.	2.060
.	STDEV x 95/95 TIF	.	.	0.1182%
.	% OF ORIG CNT	.	.	100.00%

t-Test: Two-Sample Assuming Unequal Variances		
	AR-15	*Z-14*
Mean	-0.000919%	0.000233%
Variance	7.86532E-08	5.82871E-07
Observations	325	323
Hypothesized Mean Difference	0	
df	407	
t Stat	-0.254740402	
P(T<=t) one-tail	0.399526137	
t Critical one-tail	1.648604666	
P(T<=t) two-tail	0.799052273	
t Critical two-tail	1.965809133	
Standard Deviation	0.02805%	0.07635%

Intermediate Range Monitors				7-41A-F		CALIBRATION FILE	DRIFT ANALYSIS
							The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc.
		(Days)		Initial Data	Initial Data	Raw Drift Data	Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	Circuit	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41A	5/12/2001	18	AR-15	0.00100	0.00100	0.0100%	
7-41A	4/24/2001	222	AR-15	0.00100	0.00000	0.0100%	
7-41A	9/14/2000	842	AR-15	0.00000	0.00000	-0.0120%	
7-41A	5/26/1998	900	AR-15	0.00120	0.00120	0.0020%	
7-41A	12/8/1995	836	AR-15	0.00100	0.00100	0.0000%	
7-41A	8/24/1993		AR-15	0.00100	0.00100		
7-41B	5/12/2001	53	AR-15	0.00400	0.00400	0.0440%	
7-41B	3/20/2001	886	AR-15	-0.01370	-0.00040	-0.2070%	AF Data Out of Tolerance
7-41B	10/16/1998	414	AR-15	0.00700	0.00700	0.0700%	
7-41B	8/28/1997	125	AR-15	0.01100	0.00000	0.1200%	Only IRMs A-E Tested. As Found Data Out of Tolerance.
7-41B	4/25/1997	504	AR-15	-0.01100	-0.00100	-0.0900%	AF Data Out of Tolerance
7-41B	12/8/1995	826	AR-15	-0.00200	-0.00200	-0.0500%	
7-41B	9/3/1993	10	AR-15	0.01000	0.00300	0.0100%	AF Data Out of Tolerance
7-41B	8/24/1993		AR-15	0.00900	0.00900		
7-41C	5/12/2001	240	AR-15	0.00200	0.00200	-0.0700%	
7-41C	9/14/2000	842	AR-15	0.00900	0.00900	0.0600%	
7-41C	5/26/1998	900	AR-15	0.00300	0.00300	-0.0200%	
7-41C	12/8/1995	836	AR-15	0.00500	0.00500	-0.0100%	
7-41C	8/24/1993		AR-15	0.00600	0.00600		
7-41D	5/12/2001	240	AR-15	0.00000	0.00000	-0.0700%	
7-41D	9/14/2000	842	AR-15	0.00700	0.00700	0.0520%	
7-41D	5/26/1998	900	AR-15	0.00180	0.00180	-0.0120%	
7-41D	12/8/1995	836	AR-15	0.00300	0.00300	-0.0200%	
7-41D	8/24/1993		AR-15	0.00500	0.00500		
7-41E	5/12/2001	240	AR-15	-0.00260	-0.00260	-0.0560%	
7-41E	9/14/2000	842	AR-15	0.00300	0.00300	0.0420%	
7-41E	5/26/1998	900	AR-15	-0.00120	-0.00120	-0.0120%	
7-41E	12/8/1995	836	AR-15	0.00000	0.00000	-0.0400%	
7-41E	8/24/1993		AR-15	0.00430	0.00400		
7-41F	5/12/2001	53	AR-15	0.00222	0.00222	0.0222%	
7-41F	3/20/2001	510	AR-15	-0.01070	0.00000	-0.1070%	AF Data Out of Tolerance
7-41F	10/27/1999	915	AR-15	0.01050	0.00000	0.1050%	AF Data Out of Tolerance
7-41F	4/25/1997	504	AR-15	-0.01000	0.00000	-0.0700%	AF Data Barely In Tolerance & Adjusted
7-41F	12/8/1995	811	AR-15	-0.00300	-0.00300	-0.0300%	
7-41F	9/18/1993	25	AR-15	0.01100	0.00000	0.0300%	AF Data Out of Tolerance

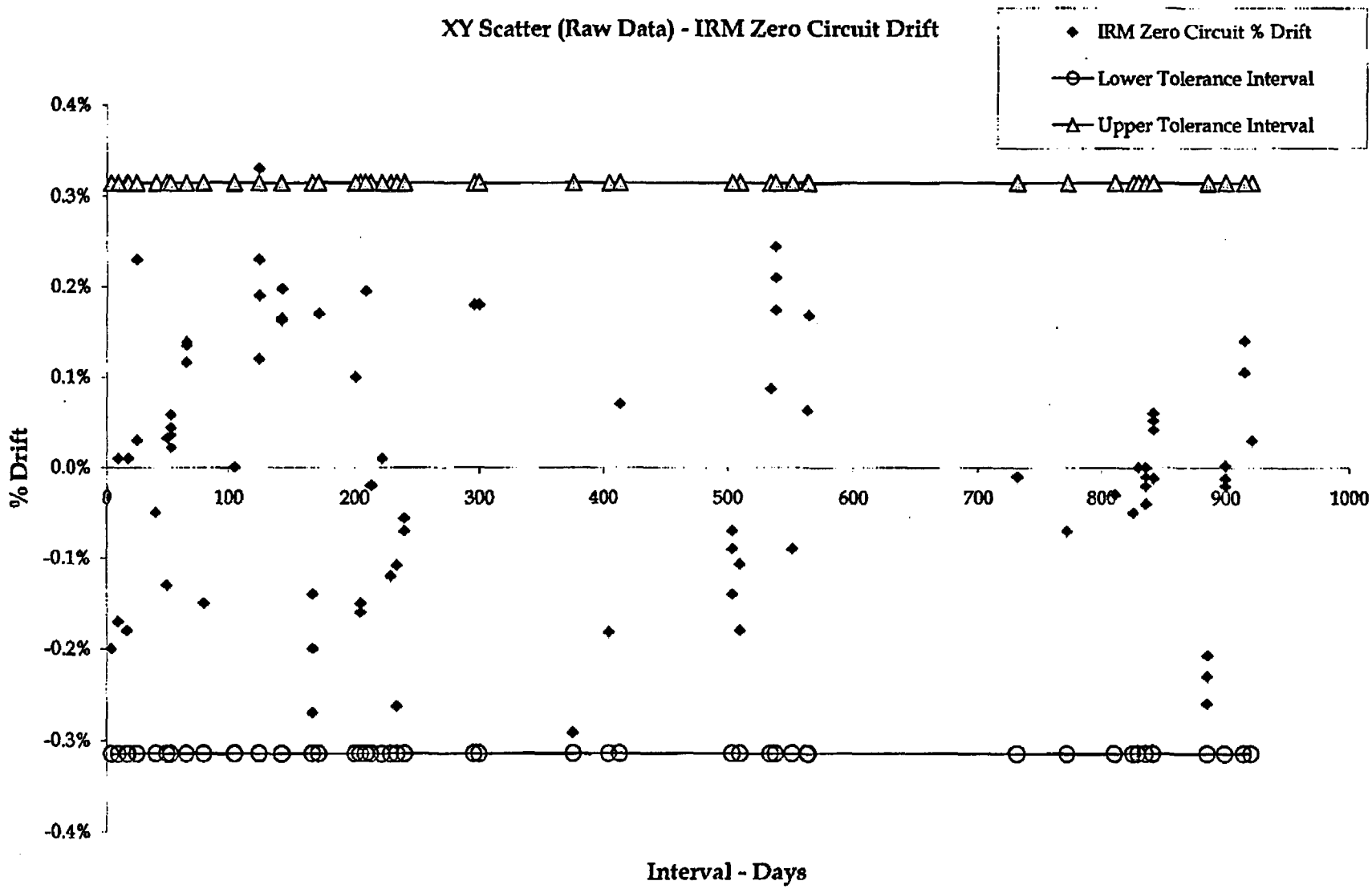
Intermediate Range Monitors				7-41A-F	CALIBRATION FILE		DRIFT ANALYSIS
							The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc.
		(Days)		Initial Data	Initial Data	Raw Drift Data	Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	Circuit	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41F	8/24/1993		AR-15	0.00800	0.00800		
7-41A	5/12/2001	18	Z-14	0.00100	0.00100	0.0100%	
7-41A	4/24/2001	921	Z-14	0.00100	0.00000	0.0300%	
7-41A	10/16/1998	213	Z-14	-0.00200	-0.00200	-0.0200%	
7-41A	3/17/1998	830	Z-14	0.00000	0.00000	0.0000%	
7-41A	12/8/1995	731	Z-14	0.00000	0.00000	-0.0100%	
7-41A	12/7/1993	105	Z-14	0.00000	0.00100	0.0000%	
7-41A	8/24/1993		Z-14	0.00000	0.00000		
7-41B	5/12/2001	534	Z-14	0.00900	0.00900	0.0870%	
7-41B	11/25/1999	405	Z-14	-0.01600	0.00030	-0.1820%	AF Data Out of Tolerance
7-41B	10/16/1998	143	Z-14	0.02000	0.00220	0.1980%	AF Data Out of Tolerance
7-41B	5/26/1998	66	Z-14	0.01390	0.00020	0.1390%	AF Data Out of Tolerance
7-41B	3/21/1998	205	Z-14	-0.01500	0.00000	-0.1600%	AF Data Out of Tolerance
7-41B	8/28/1997	125	Z-14	0.03300	0.00100	0.3300%	Only IRMs A-E Tested. As Found Data Out of Tolerance.
7-41B	4/25/1997	234	Z-14	-0.01100	0.00000	-0.1080%	AF Data Out of Tolerance
7-41B	9/3/1996	538	Z-14	0.02440	-0.00020	0.2440%	AF Data Out of Tolerance
7-41B	3/15/1995	167	Z-14	-0.02700	0.00000	-0.2700%	AF Data Out of Tolerance
7-41B	9/29/1994	300	Z-14	0.01900	0.00000	0.1800%	AF Data Out of Tolerance
7-41B	12/3/1993	50	Z-14	-0.01300	0.00100	-0.1300%	AF Data Out of Tolerance
7-41B	10/14/1993	41	Z-14	-0.01100	0.00000	-0.0500%	AF Data Out of Tolerance
7-41B	9/3/1993	10	Z-14	-0.01700	-0.00600	-0.1700%	AF Data Out of Tolerance
7-41B	8/24/1993		Z-14	0.03800	0.00000		AF Data Out of Tolerance
7-41C	5/12/2001	53	Z-14	0.00630	0.00630	0.0580%	
7-41C	3/20/2001	886	Z-14	-0.02600	0.00050	-0.2600%	AF Data Out of Tolerance
7-41C	10/16/1998	143	Z-14	0.01660	0.00000	0.1630%	AF Data Out of Tolerance
7-41C	5/26/1998	66	Z-14	0.01160	0.00030	0.1160%	AF Data Out of Tolerance
7-41C	3/21/1998	4	Z-14	-0.02000	0.00000	-0.2000%	AF Data Out of Tolerance
7-41C	3/17/1998	201	Z-14	0.01000	0.00000	0.1000%	
7-41C	8/28/1997	125	Z-14	0.02300	0.00000	0.2300%	Only IRMs A-E Tested.
7-41C	4/25/1997	234	Z-14	-0.02600	0.00000	-0.2630%	AF Data Out of Tolerance
7-41C	9/3/1996	538	Z-14	0.01740	0.00030	0.1740%	AF Data Out of Tolerance
7-41C	3/15/1995	167	Z-14	-0.01400	0.00000	-0.1400%	AF Data Out of Tolerance
7-41C	9/29/1994	172	Z-14	0.01700	0.00000	0.1700%	AF Data Out of Tolerance
7-41C	4/10/1994	229	Z-14	-0.01100	0.00000	-0.1200%	AF Data Out of Tolerance
7-41C	8/24/1993		Z-14	0.02400	0.00100		AF Data Out of Tolerance

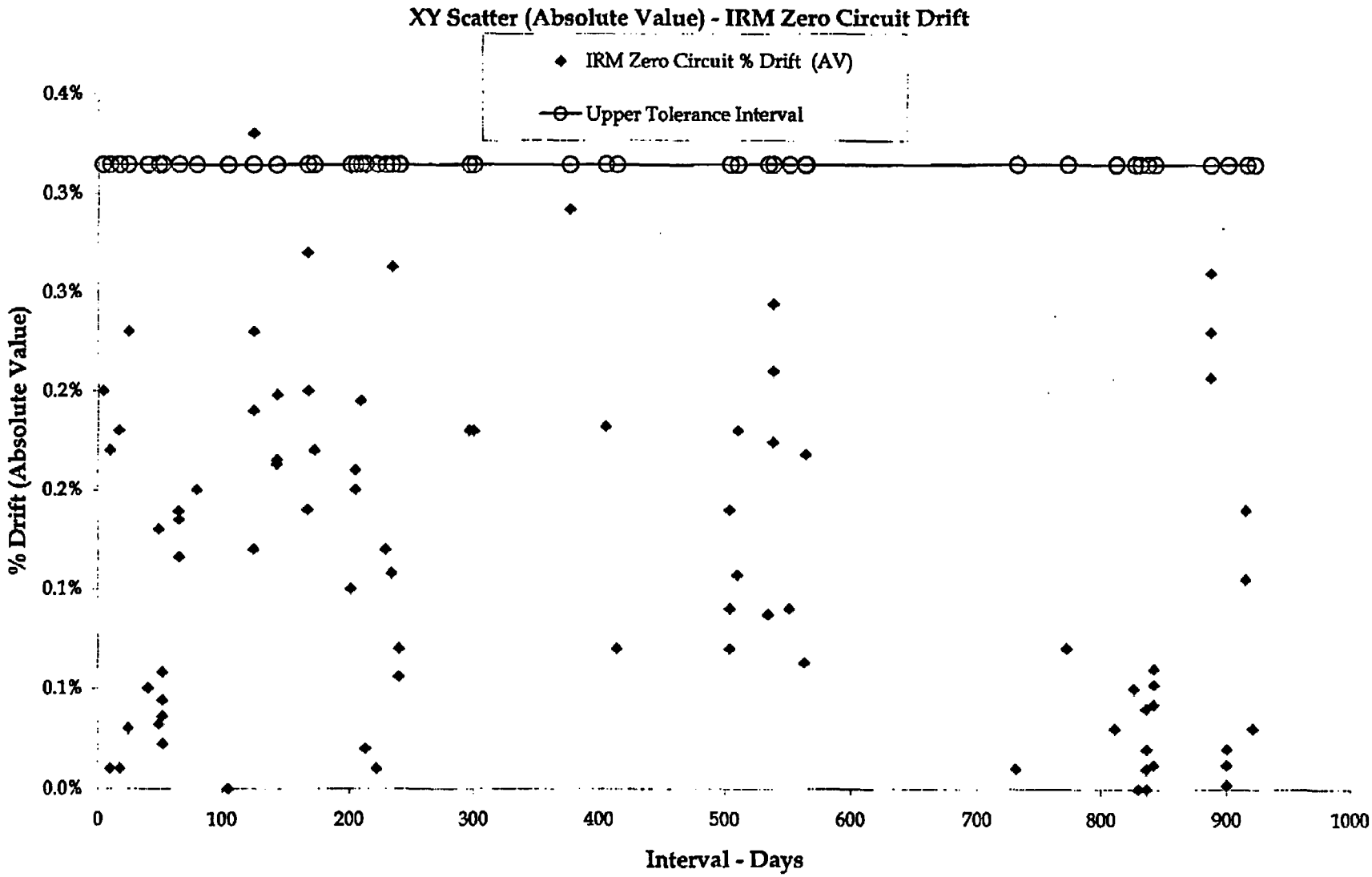
Intermediate Range Monitors				7-41A-F	CALIBRATION FILE		DRIFT ANALYSIS
							The Zero Adjust Circuits for DC Amplifier AR-15 and Feedback Module Z-14 are 0 Vdc.
		(Days)		Initial Data	Initial Data	Raw Drift Data	Tolerance = ± 10 mVdc or ± 0.01 Vdc
Tag	Date	Interval	Circuit	As Found	As Left	% Drift	Range = 0-10 Vdc
7-41D	5/9/2001	50	Z-14	0.00330	ILL	0.0320%	IRMs B, D and F Tested., AL Value for Z-14 Circuit is Illegible.
7-41D	3/20/2001	886	Z-14	-0.02100	0.00010	-0.2300%	AF Data Out of Tolerance
7-41D	10/16/1998	209	Z-14	0.01950	0.00200	0.1950%	AF Data Out of Tolerance
7-41D	3/21/1998	205	Z-14	-0.01500	0.00000	-0.1500%	AF Data Out of Tolerance
7-41D	8/28/1997	125	Z-14	0.01900	0.00000	0.1900%	Only IRMs A-E Tested.
7-41D	4/25/1997	504	Z-14	-0.01600	0.00000	-0.1400%	AF Data Out of Tolerance
7-41D	12/8/1995	836	Z-14	-0.00200	-0.00200	-0.0400%	
7-41D	8/24/1993		Z-14	0.02000	0.00200		
7-41E	5/12/2001	53	Z-14	0.00390	0.00390	0.0360%	
7-41E	3/20/2001	510	Z-14	-0.01100	0.00030	-0.1800%	AF Data Out of Tolerance
7-41E	10/27/1999	915	Z-14	0.00700	0.00700	0.1400%	
7-41E	4/25/1997	772	Z-14	-0.00700	-0.00700	-0.0700%	
7-41E	3/15/1995	551	Z-14	-0.00900	0.00000	-0.0900%	AF Data Not Out of Tolerance, Even Though AF Differs from AL on Z-14 Zero Circuit.
7-41E	9/10/1993	17	Z-14	-0.01700	0.00000	-0.1800%	AF Data Out of Tolerance
7-41E	8/24/1993		Z-14	0.01200	0.00100		AF Data Out of Tolerance
7-41F	5/12/2001	563	Z-14	0.00730	0.00730	0.0630%	
7-41F	10/27/1999	376	Z-14	-0.02820	0.00100	-0.2920%	AF Data Out of Tolerance
7-41F	10/16/1998	143	Z-14	0.01700	0.00100	0.1653%	AF Data Out of Tolerance
7-41F	5/26/1998	66	Z-14	0.01350	0.00047	0.1350%	AF Data Out of Tolerance
7-41F	3/21/1998	564	Z-14	0.01700	0.00000	0.1680%	AF Data Out of Tolerance
7-41F	9/3/1996	538	Z-14	0.02100	0.00020	0.2100%	AF Data Out of Tolerance
7-41F	3/15/1995	167	Z-14	-0.01700	0.00000	-0.2000%	AF Data Out of Tolerance
7-41F	9/29/1994	296	Z-14	0.01900	0.00300	0.1800%	AF Data Out of Tolerance
7-41F	12/7/1993	80	Z-14	-0.01500	0.00100	-0.1500%	AF Data Out of Tolerance
7-41F	9/18/1993	25	Z-14	0.02300	0.00000	0.2300%	AF Data Out of Tolerance
7-41F	8/24/1993		Z-14	0.03800	0.00000		AF Data Out of Tolerance

Combined Zero Circuit, Extended Int.	Tag	Date	Interval	% Span
	7-41A	05/12/01	18	0.01000%
	7-41A	04/24/01	222	0.01000%
	7-41A	09/14/00	842	-0.01200%
	7-41A	05/26/98	900	0.00200%
	7-41A	12/08/95	836	0.00000%
	7-41B	05/12/01	53	0.04400%
	7-41B	03/20/01	886	-0.20700%
	7-41B	10/16/98	414	0.07000%
	7-41B	08/28/97	125	0.12000%
	7-41B	04/25/97	504	-0.09000%
	7-41B	12/08/95	826	-0.05000%
	7-41B	09/03/93	10	0.01000%
	7-41C	05/12/01	240	-0.07000%
	7-41C	09/14/00	842	0.06000%
	7-41C	05/26/98	900	-0.02000%
	7-41C	12/08/95	836	-0.01000%
	7-41D	05/12/01	240	-0.06997%
	7-41D	09/14/00	842	0.05200%
	7-41D	05/26/98	900	-0.01200%
	7-41D	12/08/95	836	-0.02000%
	7-41E	05/12/01	240	-0.05600%
	7-41E	09/14/00	842	0.04200%
	7-41E	05/26/98	900	-0.01200%
	7-41E	12/08/95	836	-0.04000%
	7-41F	05/12/01	53	0.02220%
	7-41F	03/20/01	510	-0.10700%
	7-41F	10/27/99	915	0.10500%
	7-41F	04/25/97	504	-0.07000%
	7-41F	12/08/95	811	-0.03000%
	7-41F	09/18/93	25	0.03000%
	7-41A	05/12/01	18	0.01000%
	7-41A	04/24/01	921	0.03000%
	7-41A	10/16/98	213	-0.02000%
	7-41A	03/17/98	830	0.00000%
	7-41A	12/08/95	731	-0.01000%
	7-41A	12/07/93	105	0.00000%
	7-41B	05/12/01	534	0.08700%
	7-41B	11/25/99	405	-0.18200%
	7-41B	10/16/98	143	0.19800%

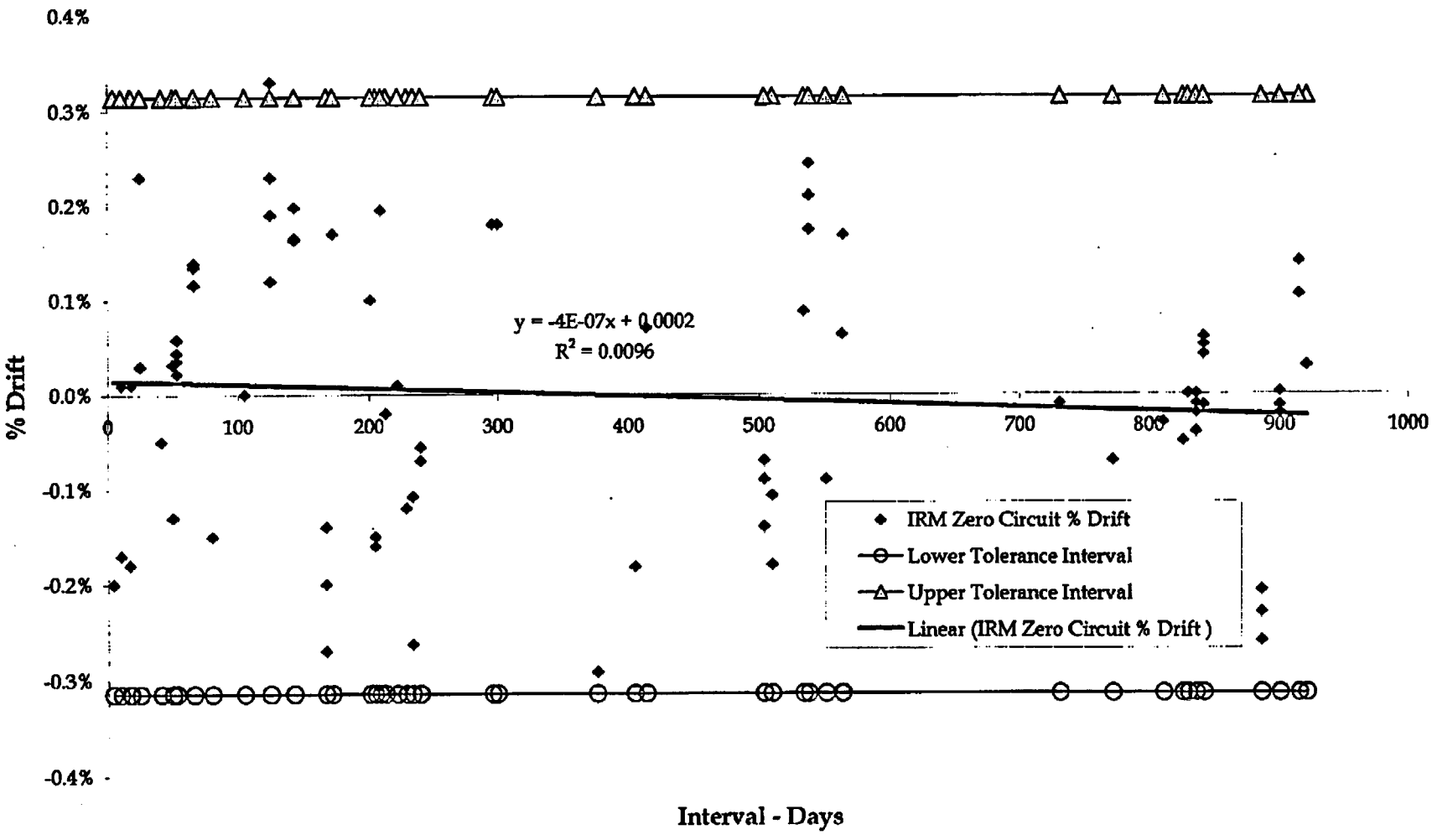
Combined Zero Circuit, Extended Int.	Tag	Date	Interval	% Span
	7-41B	05/26/98	66	0.13900%
	7-41B	03/21/98	205	-0.16000%
	7-41B	08/28/97	125	0.33000%
	7-41B	04/25/97	234	-0.10800%
	7-41B	09/03/96	538	0.24400%
	7-41B	03/15/95	167	-0.27000%
	7-41B	09/29/94	300	0.18000%
	7-41B	12/03/93	50	-0.13000%
	7-41B	10/14/93	41	-0.05000%
	7-41B	09/03/93	10	-0.17000%
	7-41C	05/12/01	53	0.05800%
	7-41C	03/20/01	886	-0.26000%
	7-41C	10/16/98	143	0.16300%
	7-41C	05/26/98	66	0.11600%
	7-41C	03/21/98	4	-0.20000%
	7-41C	03/17/98	201	0.10000%
	7-41C	08/28/97	125	0.23000%
	7-41C	04/25/97	234	-0.26300%
	7-41C	09/03/96	538	0.17400%
	7-41C	03/15/95	167	-0.14000%
	7-41C	09/29/94	172	0.17000%
	7-41C	04/10/94	229	-0.12000%
	7-41D	05/09/01	50	0.03200%
	7-41D	03/20/01	886	-0.23000%
	7-41D	10/16/98	209	0.19500%
	7-41D	03/21/98	205	-0.15000%
	7-41D	08/28/97	125	0.19000%
	7-41D	04/25/97	504	-0.14000%
	7-41D	12/08/95	836	-0.04000%
	7-41E	05/12/01	53	0.03600%
	7-41E	03/20/01	510	-0.18000%
	7-41E	10/27/99	915	0.14000%
	7-41E	04/25/97	772	-0.07000%
	7-41E	03/15/95	551	-0.09000%
	7-41E	09/10/93	17	-0.18000%
	7-41F	05/12/01	563	0.06300%
	7-41F	10/27/99	376	-0.29200%
	7-41F	10/16/98	143	0.16530%
	7-41F	05/26/98	66	0.13500%

Combined Zero Circuit, Extended Int.	Tag	Date	Interval	% Span
	7-41F	03/21/98	564	0.16800%
	7-41F	09/03/96	538	0.21000%
	7-41F	03/15/95	167	-0.20000%
	7-41F	09/29/94	296	0.18000%
	7-41F	12/07/93	80	-0.15000%
	7-41F	09/18/93	25	0.23000%
Combined Zero Circuit, Extended Int.	COUNT	84	84	84
	AVG INTERVAL	.	403	403
Setting = 0 Vdc	AVERAGE	.	.	-0.00155%
Tolerance = ± 0.01 Vdc	STDEV	.	.	0.13841%
Range = 0 - 10 Vdc	VARIANCE	.	.	0.00019%
(Drift calculated based on % Span)	KURTOSIS	.	.	-0.557
	SKEWNESS	.	.	-0.008
	MAXIMUM	.	921	0.33000%
	MINIMUM	.	4	-0.29200%
	95%/95% TIF	.	.	2.272
	STDEV x 95/95 TIF	.	.	0.31446%
	% OF ORIG CNT	.	.	100.00%
Crit T	.	.	.	3.180
Max Pt	.	.	.	0.44169%
Outlier Equation				
Max Pt = Absolute Value(Average)+Absolute Value(Stdev x Crit T)				
= Statistical Outliers				
= Data excluded as Outlier				

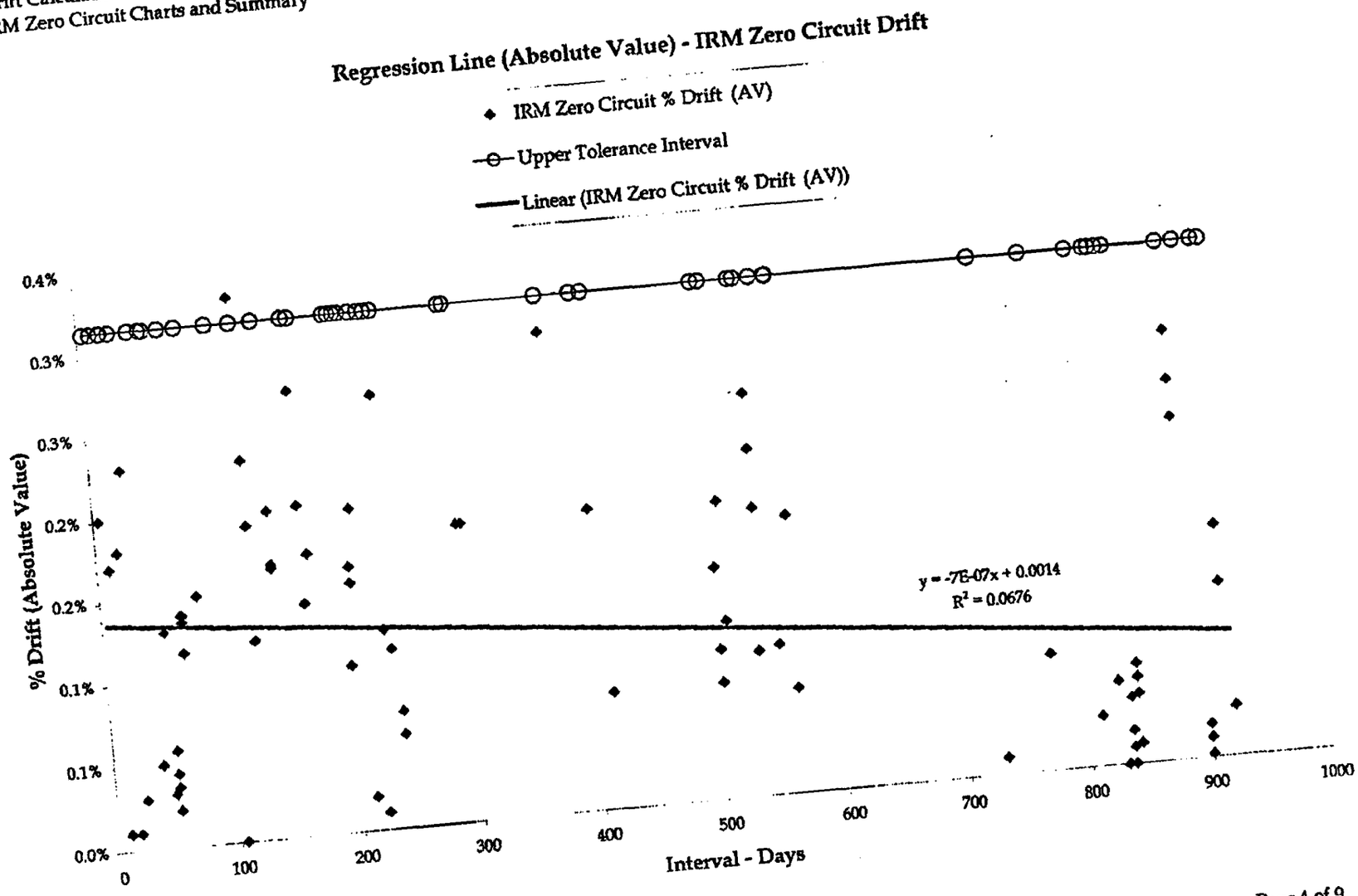

XY Scatter (Raw Data) - IRM Zero Circuit Drift
IRM Zero Circuit % Drift
Lower Tolerance Interval
Upper Tolerance Interval
0.4%
0.3%
0.2%
0.1%
0.0%
-0.1%
-0.2%
-0.3%
-0.4%
% Drift
0
100
200
300
400
500
600
700
800
900
1000
Interval - Days


XY Scatter (Absolute Value) - IRM Zero Circuit Drift
IRM Zero Circuit % Drift (AV)
Upper Tolerance Interval
% Drift (Absolute Value)
0.4%
0.3%
0.3%
0.2%
0.2%
0.1%
0.1%
0.0%
0
100
200
300
400
500
600
700
800
900
1000
Interval - Days

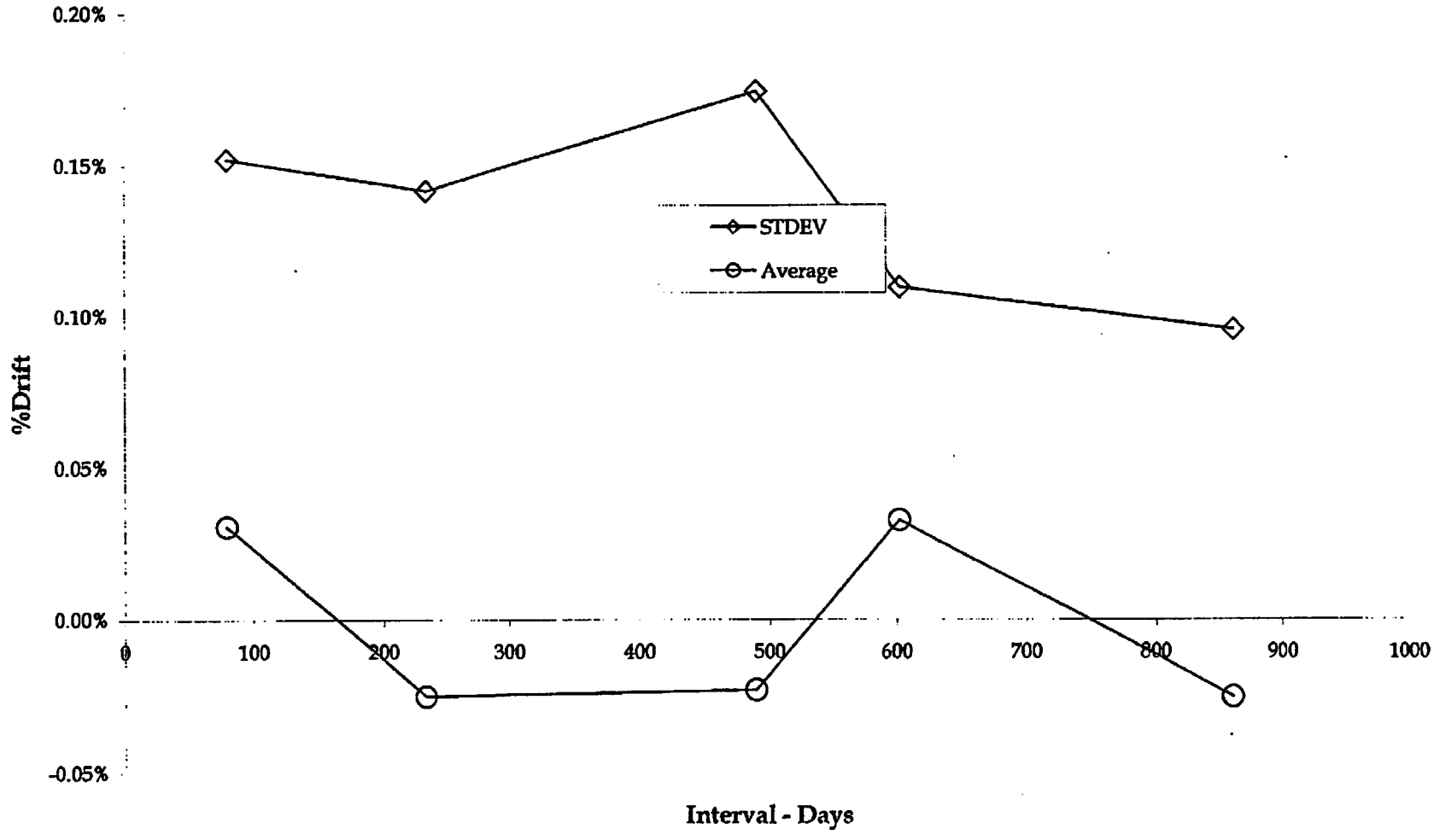
Regression Line (Raw Data) - IRM Zero Circuit Drift



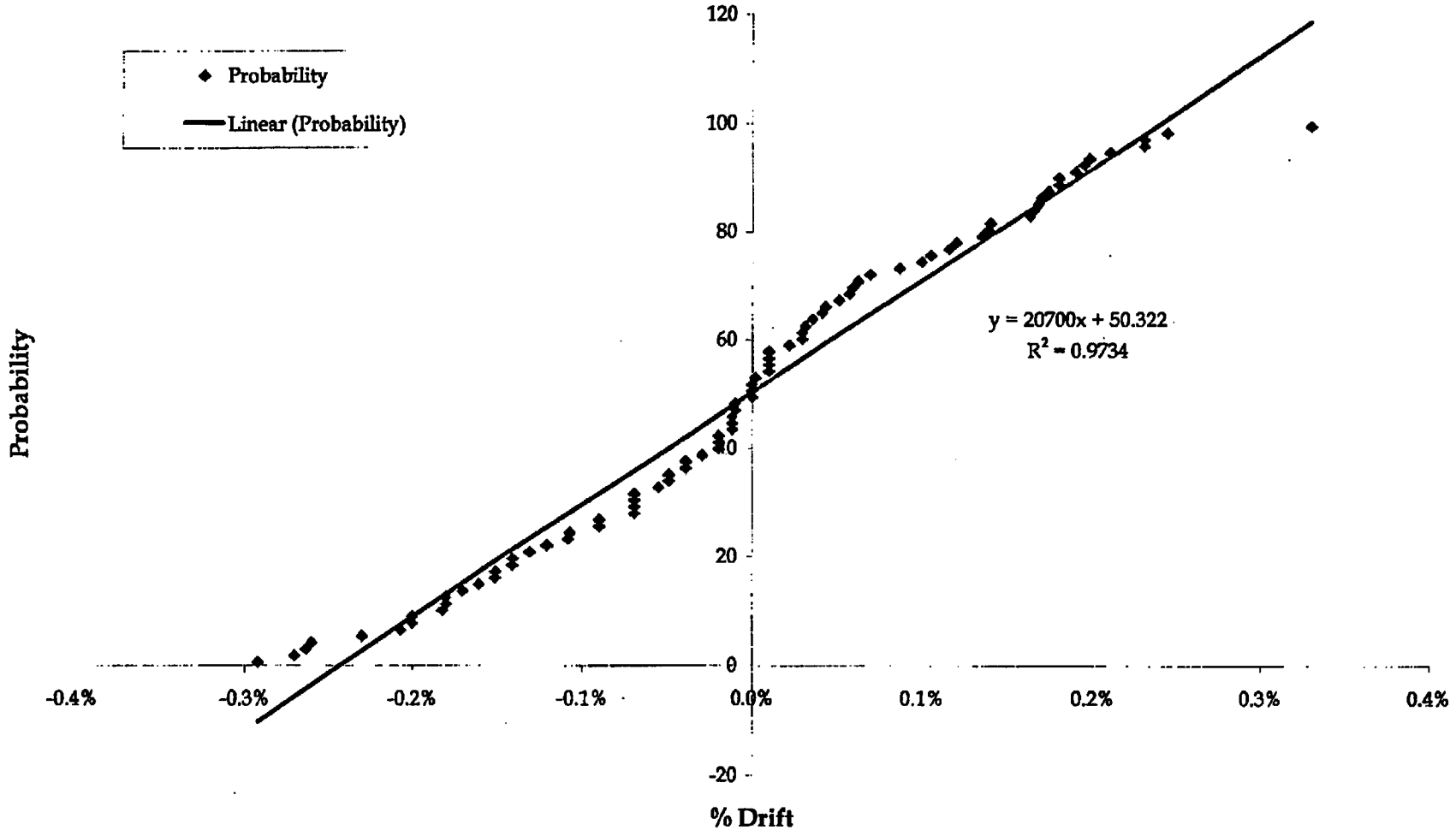
Drift Calculation for Intermediate Range Monitors
IRM Zero Circuit Charts and Summary



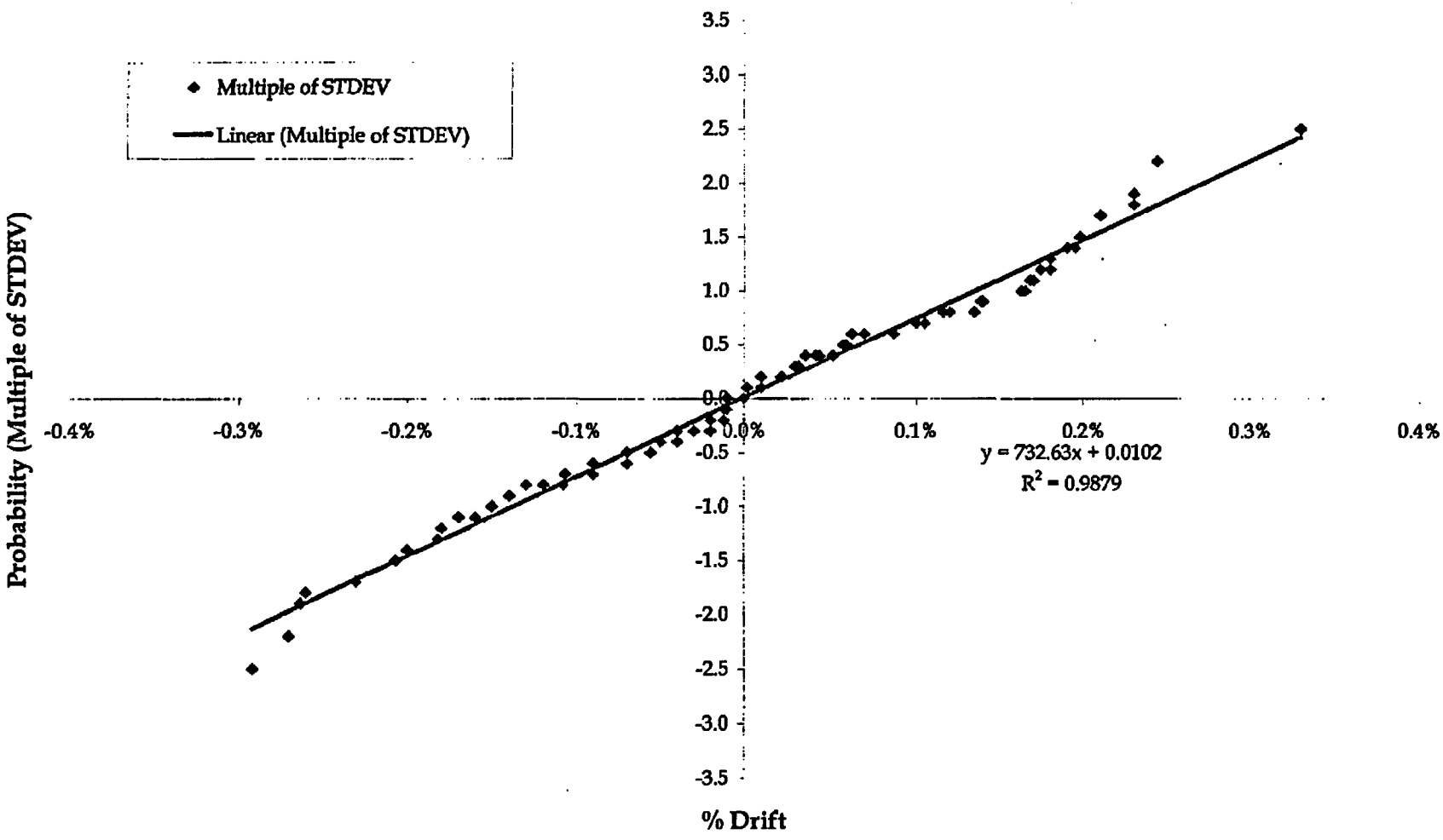
Time Dependency - IRM Zero Circuit Drift



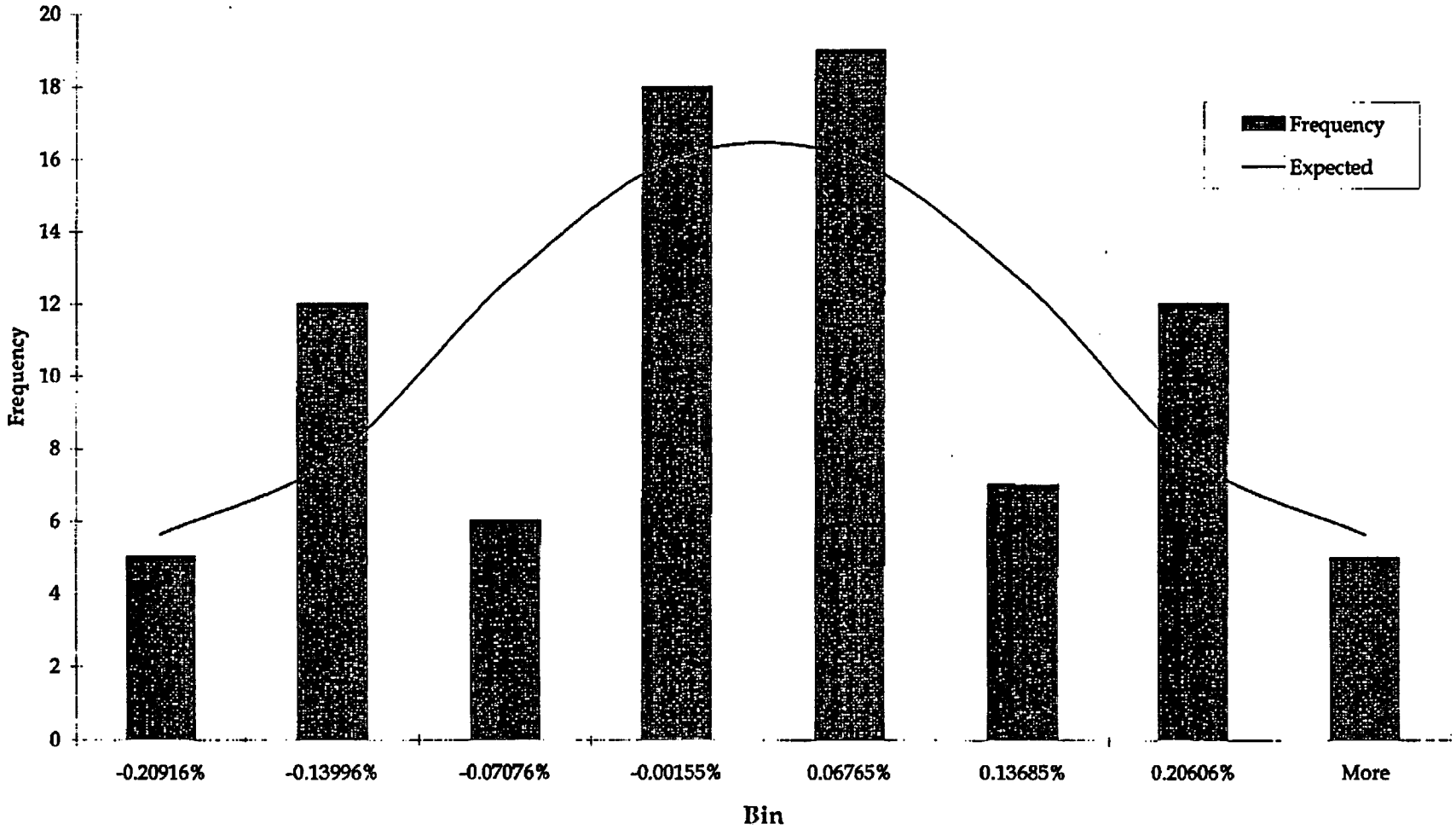
Cumulative Probability Plot - IRM Zero Circuit Drift



Normalized Probability Plot - IRM Zero Circuit Drift



Histogram - IRM Zero Circuit Drift



STDEV			
Count	84	50	82
STDEV	0.13841%	1 STDEV %	2 STDEV %
Average	-0.00155%	59.52%	97.62%
1 STDEV Range	-0.13996%	0.137%	
2 STDEV Range	-0.27837%	0.275%	
	Normal Distribution	IRM Zero Circuit % Drift	
1 Standard Deviation	68.27%	59.52%	
2 Standard Deviations	95.45%	97.62%	
MEAN BIAS			
Calibration Point	IRM Zero Circuit % Drift		
Count	84		
Average (Absoulute Value)	0.0016%		
Standard Deviation	0.1384%		
Absolute Value of Maximum Allowed Average	0.030%		
Mean Bias	No		
D' TEST SUMMARY			
D' Upper Acceptance Limit	220.30		
Calculated D' Value	219.25		
D' Lower Acceptance Limit	210.60		

Page 1 of 2

VY CALCULATION REVIEW FORM

Calculation Number: VYC-2236 Revision Number: 0 CCN Number: N/A

Title: Drift Calculation for Intermediate Range Monitors

Reviewer Assigned: Brian F. Davidson Required Date:

☐ Interdiscipline Review ☒ Independent Review

Comments*	Resolution
1. Sections 2.3.5 through 2.3.10 should reference both Att. 3 and Att. 9 for consistency.	Corrected.
2. Total pages should be identified on cover page. Pages 2 and 3 need pagination. Page 4-end have incorrect page numbers.	Incorporated.
3. Add IRM System No. to Page 2.	Added
4. Revise attachment headings to match attachment listing.	Corrected.
5. OP 4301 Revision level should be 17. LPC#1	Corrected.
6. Add specific conclusions that drift is conservative with respect to VYC-692A.	Added new Section 5.7.
7. Average for 0-600 day bin on Table 4 shows incorrect sign.	Corrected

Reviewer Signature / Date 6/25/02

Kirk R. Melson / Jerry Dobbs 6/26/02
Calculation Preparer (Comments Resolved) Date

Method of Review:
☒ Calculation/Analysis Review
☐ Alternative Calculation
☐ Qualification Testing

Reviewer Signature (Comments Resolved) / Date 6/26/02

Page 2 of 2

VY CALCULATION REVIEW FORM

Calculation Number: VYC-2236 Revision Number: 0 CCN Number: N/A

Title: Drift Calculation for Intermediate Range Monitors

Reviewer Assigned: Brian E. Davidson Required Date:

☐ Interdiscipline Review ☒ Independent Review

Comments*	Resolution
8. Section 5.5.2 refers to Attachment 7, but it should be 14 instead	Corrected
9. Table 10, Average should be negative instead of positive.	Intent was that Tables 6 and 10 show Absolute Value of Average – Changed labels in Tables, and made both values positive.
10. Data entry error for IRM 7-41B on 5/12/97; actual data should be 107.0 / 107.0 and 119.0 / 119.0 for Hi and Hi Hi	Corrected
11. Correct Zero Circuit reference from "AR-14" to "AR-15" in Attachments 9 and 13.	Corrected

Reviewer Signature / 6/25/02 Date

Kirk R. Nelson Jerry Dibos / 6/26/02 Date
Calculation Preparer (Comments Resolved)

Method of Review:
☒ Calculation/Analysis Review
☐ Alternative Calculation
☐ Qualification Testing

/ 6/26/02 Date
Reviewer Signature (Comments Resolved)

Page 1 of 1

VY CALCULATION OPEN ITEM LIST

Calculation Number: VYC-2236 Revision Number: 0 CCN Number: N/A

Open Item	Resolution	Method of OI Tracking or Date Closed
1. Calculation VYC-0692A Requires a revision to incorporate new updated analyzed drift values. The calculation currently uses conservative drift values, so there is no immediate impact.	Revision 1 to VYC-692A being prepared concurrently with this calculation.	6/26/02

DOCUMENTATION OF COMPUTER RESOURCE USE

CALCULATION NO.: VYC-2236 REVISION NO.: 0 CCN No.: N/A

Computer Used (include manufacturer, CPU Type, and operating system version and level):

Dell, Pentium 3, Windows Millennium Edition (No Version Listed)

Computer Input Attached*? ☐ Yes ☒ No

Location/Identifier: N/A

Computer Output Attached*? ☐ Yes ☒ No

Location/Identifier: N/A

* Large volume input/output should be provided on CD. See Appendix E for format requirements.

List the computer codes used, and complete the following:

	Approved per PP 7800		Appropriateness Verified		Outstanding SPRs or Code Errors[1]	
Code Name/Version and/or Script File	Yes[3]	No	Yes	No	Yes[2]	No
Microsoft Excel 2000 / Calculation Detail and Charts (Attach. 3 thru 14)		✓	✓			✓

[1] Software Problem Report (SPR), does not exist as a reporting method in PP 7800 and AP 6030. Contact the Code sponsor and review any outstanding SPRs or Code errors. [ER2000805]
[2] If yes, fill out information below.
[3] If yes, include the Code name on the Computer Code line of the title page, VYAPF 0017.01.

If a computer code was not verified in accordance with PP 7800 and AP 6030, or if there are outstanding SPRs, state below why it is appropriate.

Code Name/Script File	Appropriateness
Microsoft Excel 2000 / Calculation Detail and Charts (Attach. 3 thru 14)	Appropriateness was verified through hand calculation using a TI-36X Calculator and Microsoft EXCEL 97SR2, which was verified via VYC-1599, Rev. 0.