Duke Power Company
Catawba Nuclear Generation Department
4800 Concord Road
York, SC 29745

D. L. Rehn
Vice President
(803)831-3205 Office
(803)831-3426 Fax

DUKE POWER

March 13, 1995

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

Subject: Catawba Nuclear Station, Unit 1
Docket No. 50-413
Technical Specification Amendment Supplemental Information
Renewal Of Steam Generator Tube Interim Plugging Criteria for Unit 1 Cycle 9

Gentlemen:

The purpose of this letter is to follow up to the recent phone conversation between Duke Power Co. and the NRC concerning the use of a 0.630 inch diameter bobbin probe (630 probe) at Catawba Unit 1.

The 630 probe had been utilized on past inspections at Catawba Unit 1 in the cold leg. The purpose of this inspection had been to enhance detection of free span cracks. The 0.610 inch diameter bobbin probe (610 probe) had been previously utilized for the inspection of the U-bends and hot legs. In order to minimize inspection time and enhance the inspection, Catawba Unit 1 utilized the 630 probe to inspect the tube full length during the recent refueling outage. An evaluation was performed to understand the differences between the probes. A summary and preliminary results are included in attachment 1 as Duke Power committed to in our phone conservation on March 8, 1995.

The preliminary results of the evaluation indicate more variation between the probes than expected. This variation is probably due to analyst variability and not associated with the probes. While the data is further evaluated to determine the source of the error, conservative adjustments have been made with respect to our plugging criterion at Catawba Unit 1 to account for the error.

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Catawba is committing to the following Steam Generator Tube Plugging criteria which provides for the conservative adjustments necessary:

> Flaw indications with a bobbin coil voltage less than or equal to 1.0 volt or 0.8 volt for tubes inspected by a 0.630 inch probe can remain in service without further action. For flaw indications in excess of 1.0 volt or 0.8 volt for tubes inspected by a 0.630 inch probe but less than 2.7 volts or 2.2 volts for tubes inspected by a 0.630 inch probe, the tube can remain in service provided an RPC inspection of the indication does not detect ODSCC or any other degradation mode. Crack indications above 2.7 volts or 2.2 volts for tubes inspected by a 0.630 inch probe, will be plugged or repaired by sleeving, and do not require RPC confirmation.

In addition Catawba also commits to performing a more detailed assessment of the evaluation which will be included in the 90 day report. An assessment of the NDE error associated with the use of a 630 probe on the IPC will also be included in the 90 day report.

Attachment A to this letter provides a comparison of 0.630 and 0.630 bobbin probes.

Attachment B is a table of data collected on Unit 1 with 3 graphs redundant to those provided in Attachment A.

Pursuant to 10 CFR 50.91 (b)(1), the appropriate South Carolina official is being provided a copy of this amendment request.

Very truly yours,

D. L. Rehn

Attachments

DT/

xc: Mr. S. D. Ebneter
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323

Mr. Max Batavia, Chief
Bureau of Radiological Health
South Carolina Department of Health &
Environmental Control
2600 Bull Street
Columbia, SC 29201

Mr. R. J. Freudenberger
NRC Resident Inspector
Catawba Nuclear Station

Mr. Robert E. Martin, Project Manager
ONRR

Mr. Ashok C. Thadni, Associate Director
Inspection & Technical Assessment
ONRR

American Nuclear Insurers
c/o Dottie Sherman, ANI Library
The Exchange, Suite 245
270 Farmington Avenue
Farmington, CT 06032

M & M Nuclear Consultants
1166 Avenue of the Americas
New York, NY 10036-2774

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

ATTACHMENT A

Attachment A
Catawba Unit 1
Comparison of 630 and 610 Bobbin Probes

Background

The 0.630 inch diameter probe (630 probe) had been utilized on past inspections at Catawba Unit 1 in the cold leg. The purpose of this inspection had been to enhance detection of free span cracks. The 0.610 inch diameter probe (610 probe)had been previously utilized for the inspection of the U-bend and hot legs. In order to minimize inspection time and enhance the inspection, Catawba Unit 1 utilized the 0.630 inch diameter probe to inspect the tube full length. An evaluation was performed to quantify the differences between the probes. The evaluation utilized ASME standard test data, McGuire Unit 2 test data and Catawba Unit 1 test data.

By applying the use of a 0.630 bobbin coil probe for the inspection at Catawba Unit 1, it is our opinion that by so doing we could enhance the detection and sizing of all indications. The 0.630 inch bobbin probe has been used at our McGuire Nuclear Station because of its enhanced capability for detecting small free span indications. It was also apparent in our testing of TSP indications at the McGuire plant, that the 0.630 probe resulted in clearer signals (i.e. sharper transitions) for small indications. This thinking is supported by several eddy current related rationale.

In our opinion, the use of a 0.630 probe will increase the fill factor or probe to tube coupling and therefore increase our sensitivity to degradation. Since the eddy currents are more densely populated near the coil windings and decrease with distance, it was our reasoning that improving our probe to tube coupling would accomplish our two objectives. The first objective would be to concentrate more of the eddy currents in closer proximity to the ID of the tube and subsequently increase the concentration of the eddy currents throughout the tube wall. The second reason was that by increasing the probe diameter, we could further reduce the undesirable effects that probe motion or wobble, would have on any signals of degradation. Therefore, by implementing the use of a .630" probe, we would enhance our inspection by increasing our sensitivity to degradation while reducing the effects of extraneous signals.

A resultant enhancement from the use of a 0.630 probe would be our increased ability to better size ODSCC indications. By instituting the use of a 0.630 probe, increasing our sensitivity to indications and further eliminating the influence of probe motion on these indications, we feel this would give us a more accurate representation of the true voltage of the indication signal.

ASME Standard Test

An ASME standard was pulled 31 times with a 0.610 probe and a 0.630 probe. The data was normalized to 2.75 volts for the 4-20% through wall flat bottom holes on a 550/130 kHz differential mix (mix-1). The voltage of each ASME hole was then measured off of Mix 1. It is our assessment that the probes perform essentially identically for the ASME standards. The average of the ratio of the 630 volts to the 610 volts is 1.01 with a standard deviation of less than 0.02. This trend was evident for each category of standard analyzed, hence it is likely that a real difference exists, but is not significant to the performance of the probes. See data in Attachment 1.

McGuire Data Test

During the most recent McGuire Unit 2 refueling outage, a comparison was made of TSP indications which were run with a 610 and 630 probe. The preliminary results of the analysis are summarized below. The data is presented in Attachments 2-4.

On average the 610 probe voltage was 93% of the 630 probe voltage, with a standard deviation of 15%. Also on average the 610 volts were 0.05 Volts less than the 630 probe volts with a standard deviation of 0.08 Volts. The correlation of the 630 volts to the 610 volts had an index of determination of 91.1%. Hence, there is a relatively strong correlation of the 630 voltage to the 610 voltage.

The index of determination for the correlation of the ratio of the voltages to the 610 probe volts was 7%. For the correlation of the ratio to the 630 volts the index was 0.05%. Hence, it is likely that there is no correlation between the ratio of the probes volts to the absolute voltage.

The index of determination of the correlation of the difference in probe voltages to the 610 probe voltage was 1.4%. For the 630 probe voltages the index was 3.3%. Hence, the data did not indicate that the differences in probe voltages is correlated to the absolute volts of the indications. This is most likely due to the small difference from unity in the voltage ratio, the small sample size, and the fact that the majority of the data is less than 0.8 volts.

Since the ratio of the volts is likely not correlated to the voltage it is reasonable to assume that a single ratio value can be established for converting the volts obtained from the 630 probe into equivalent values for the 610 probe. However, due to the limited amount of McGuire TSP indication data, additional data was acquired at Catawba Unit 1. We established a 90% confidence bound on the ratio for application at Catawba. The statistics would be based on a non-parametric evaluation. The plan for data collection, data analysis, and acceptance criteria are described below.

Data Analysis

Each of the indications in the data samples, or bins were reinspected using new 610 and 630 bobbin coil probes. The results of the inspection were analyzed by independent eddy current analyst inspection teams. The team using the 610 probe was independent and isolated from the team evaluating the results from the 630 probe. The results of the reinspection/analysis were then categorized into analysis bins using the same limits as above for the source bins according to the voltage from the 610 probe. An additional bin, referred to as analysis bin 0, for indications with a 610 probe amplitude of less than or equal to 0.59 volts was created. A comparison of the probes' results for each bin was then performed.

Discussion of Analysis Results

In contrast to the results from the preliminary study, little correlation was evident between the probes in bin 0 through 2. A strong correlation was found between the probe voltages for bin 3. Relative to the application of IPC, bin 3 with 610 probe voltages greater than 1.0 volts is the most meaningful.

The final segregation of data resulted in a total of 83 data pairs in bin 3. A comparison of the probe voltages is illustrated on Figure 1. The index of determination (the square of the correlation coefficient) of the correlation of the 630 volts to the 610 volts was found to be 95.2 %. Hence the data indicated that the 630 probe volts are strongly correlated to the 610 probe volts. The average ratio of the 610 probe volts to the 630 probe volts was 1.13 with a standard deviation of 0.09. The average difference of the 610 voltage from the 630 probe volts was 0.16 volts with a standard deviation of 0.13 volts. The index of determination of the ratio of the probe readings, see figure 2, to the voltage was found to be 3.2%. The index of determination of the difference in the probe readings, see figure 3, to the 610 voltage was found to be 35.6 %. As expected from early consideration and previous experience the ratio of the readings is likely independent of the probe voltage. While the difference in readings may appear to exhibit a low correlation, the opposite is the case. The correlation coefficient is 0.60. This coefficient is significant at a greater than 99.9% level for the data sample size (83). This is consistent with the ratio of the probe amplitudes exhibiting no correlation .i.e., for a constant ratio of volts the difference in voltage readings must increase with voltage.

In summary, neither criterion 1)nor criterion 2) as delineated above are met . Hence the 90% confidence limit on the ratio of the 610 probe voltage to the 630 probe voltage should be applied to the 630 probe amplitude to determine the voltage level to trigger inspection of an indication using RPC.

Catawba Data Collection

Approximately two hundred (200) hot leg tube support plate indications have been acquired for the purpose of comparing the 630 probe to the 610 probe. The elements of the data collected consisted of collating sample data as follows:

1) A random sample of fifty (50) indications with 630 amplitudes in the voltage range of 0.60 to 0.79 volts (referred to as source bin 1).

2) A random sample of fifty (50) indications with a 630 amplitudes in the voltage range of 0.80 to 0.99 volts (referred to as source bin 2).

3) All ODSCC indications greater than or equal 1.00 volts as measured by the 630 probe (referred to as source bin 3).

Catawba Data Acceptance Criteria

The criterion developed for the use of the 630 probe field data were delineated as follows:

1) If the mean difference between the probes was 0.05 volts with a standard deviation of less than or equal to 10 %, the 630 probe data would be used directly for Interim Plugging Criterion (IPC) purposes.

2) If the ratio of the 610 to 630 volts was less than 1.1 at a 90% confidence level, with an attendant small standard deviation, the volts obtained from the 630 probe would be adjusted by the average ratio adjusted to a 90 % confidence level.

3) If neither of the previous criterion are met, the 630 voltages would be adjusted by the ratio of the probes output at a 90% confidence level, and all indications with adjusted voltages greater than 1.0 volts would be inspected by a rotating pancake coil (RPC) probe. This is the same as reducing the 630 criterion for performing RPC.

We would plan to ratio the 630 probe voltages by a constant if the 610 to 630 ratio is less than 1.1 at a 90% confidence limit if the standard deviation on the ratio is small (approximately less than or equal to 5%). The ratio limit is small to prevent unnecessarily plugging indications due to the 90% confidence limit. If neither of these criteria are satisfied, we would plan to inspect all 630 probe indications with a voltage greater than the 1.0 volt repair limit divided by the ratio at 90% confidence limits.

Determination of Repair criterion

The distribution of the ratio of the probe amplitudes is illustrated on Figure 4. Based on non-parametric statistics, the 90% confidence bound for a 95 % portion of population is given by the 81st ordered value. This actually gives a lower 92% confidence on the ratio of the 630 probe volts to the 610 probe volts of 0.8. Since the IPC is based on a 610 bobbin coil probe voltage of greater than 1.0 volts as a trigger to perform a RPC inspection of the indication, the appropriate trigger using the 630 bobbin coil probe is 0.8 volt. Relative to the Catawba Unit 1 IPC, RPC confirmation of bobbin indications of greater than 0.8 volts implies confirmation of indications greater than 1.0 volts had a 610 probe been used. In addition, since the ratio is independent of amplitude, The 2.7 volt limit for repair of an indication regardless of RPC confirmation should be adjusted to 2.2 volts.

Attachment 1

Voltage Comparison Data for 0.610" vs. 0.630" Diameter ECT Probes Relative to ASME Standards.

Group #	100% Throughwall			80% Throughwall			60% Throughwall			40% Throughwall			(4) 20% Thru-wall Hole's		
	0.610" Probe	0.630" Probe	610 / 630 Ratio	0.610" Probe	0.630" Probe	610 / 630 Ratio	0.610" Probe	0.630" Probe	610 / 630 Ratio	0.610" Probe	0.630" Probe	610 / 630 Ratio	0.610" Probe	0.630" Probe	610 / 630 Ratio
2	4.39	4.25	1.03	4.20	4.09	1.03	3.33	3.44	0.97	2.10	2.15	0.98	2.74	2.73	1.00
3	4.27	4.43	0.96	4.27	4.43	0.96	3.35	3.45	0.97	2.10	2.14	0.98	2.77	2.76	1.00
4	4.37	4.33	1.01	4.13	4.24	0.97	3.37	3.32	1.02	2.11	2.16	0.98	2.76	2.78	1.01
5	4.19	4.40	0.95	4.17	4.24	0.98	3.38	3.43	0.99	2.12	2.14	0.99	2.74	2.78	1.00
6	4.21	4.40	0.96	4.06	4.20	0.97	3.37	3.47	0.97	2.12	2.14	0.99	2.73	2.75	0.99
7	4.25	4.27	1.00	4.19	4.22	0.99	3.36	3.46	0.97	2.11	2.13	0.99	2.71	2.76	0.98
8	4.31	4.32	1.00	4.20	4.16	1.01	3.35	3.45	0.97	2.09	2.17	0.96	2.69	2.76	0.97
9	4.36	4.22	1.03	4.18	4.21	0.99	3.41	3.39	1.01	2.12	2.16	0.98	2.73	2.75	0.99
10	4.31	4.31	1.00	4.05	4.17	0.97	3.32	3.42	0.97	2.12	2.16	0.98	2.70	2.75	0.98
11	4.35	4.42	0.99	4.14	4.09	1.01	3.32	3.36	0.99	2.10	2.15	0.98	2.77	2.77	1.00
46	4.36	4.29	1.02	4.09	4.08	1.00	3.33	3.40	0.98	2.10	2.14	0.98	2.73	2.75	0.99
47	4.23	4.25	1.00	4.19	4.23	0.99	3.36	3.43	0.98	2.12	2.13	1.00	2.73	2.76	0.99
48	4.27	4.43	0.96	4.06	4.14	0.98	3.37	3.41	0.99	2.11	2.14	0.99	2.75	2.76	1.00
49	4.32	4.25	1.02	4.14	4.26	0.97	3.28	3.40	0.96	2.11	2.15	0.98	2.72	2.73	1.00
50	4.40	4.36	1.01	4.22	4.23	1.00	3.34	3.43	0.97	2.11	2.14	0.99	2.74	2.76	0.99
51	4.32	4.44	0.97	4.22	4.28	0.99	3.38	3.44	0.98	2.11	2.14	0.99	2.74	2.75	1.00
52	4.36	4.43	0.98	4.07	4.16	0.98	3.33	3.44	0.97	2.12	2.13	1.00	2.73	2.78	0.98
53	4.34	4.46	0.97	4.10	4.22	0.97	3.38	3.38	1.00	2.13	2.15	0.99	2.77	2.76	1.00
54	4.44	4.44	1.00	4.08	4.21	0.97	3.34	3.41	0.98	2.12	2.14	0.99	2.73	2.76	0.99
55	4.33	4.40	0.98	4.11	4.12	1.00	3.35	3.38	0.99	2.12	2.15	0.99	2.72	2.77	0.98
87	4.43	4.37	1.01	4.23	4.14	1.02	3.41	3.46	0.99	2.11	2.18	0.98	2.74	2.76	0.99
88	4.39	4.28	1.03	4.23	4.17	1.01	3.40	3.36	1.01	2.11	2.15	0.98	2.74	2.75	1.00
89	4.39	4.41	1.00	4.06	4.24	0.96	3.43	3.40	1.01	2.11	2.15	0.98	2.75	2.76	1.00
90	4.41	4.26	1.04	4.21	4.13	1.02	3.39	3.38	1.00	2.12	2.14	0.99	2.75	2.76	1.00
91	4.34	4.38	0.99	4.07	4.22	0.96	3.38	3.39	1.00	2.11	2.17	0.97	2.72	2.75	0.99
94	4.34	4.41	0.98	4.18	4.10	1.02	3.36	3.43	0.98	2.12	2.16	0.98	2.72	2.75	0.99
96	4.26	4.36	0.98	4.19	4.18	1.00	3.42	3.43	1.00	2.12	2.19	0.97	2.71	2.77	0.98
97	4.41	4.38	1.01	4.17	4.09	1.02	3.38	3.45	0.97	2.11	2.16	0.98	2.71	2.78	0.97
98	4.40	4.37	1.01	4.07	4.28	0.95	3.34	3.42	0.98	2.12	2.17	0.98	2.73	2.77	0.99
99	4.42	4.26	1.04	4.18	4.20	1.00	3.35	3.35	1.00	2.11	2.16	0.98	2.73	2.76	0.99
100	4.27	4.39	0.97	4.10	4.23	0.97	3.35	3.47	0.97	2.10	2.16	0.97	2.72	2.76	0.99
		Average	1.00		Average	0.99		Average	0.98		Average	0.98		Average	0.99
	Standard Deviation		0.02	Standard Deviation		0.02	Standard Deviation		0.01	Standard Deviation		0.01	Standard Deviation		0.01
	Grand Average (All Tests)		0.99												
	Grand Std. Dev. (All Tests)		0.02												

Both probes were normalized to 2.75 Volts on Mix 1, a 550/130 kHz differential mix. The probes were normalized using the first Cal Std acquired and the voltage measurements for the additional standard pulls were made without re-normalizing.

The calibration standard used was 50414.

Attachment 2

McGuire Unit 2, SG "C"

Voltage Comparison of 0.610" vs. 0.630" Probe for Hot Leg Tube Support Plate (HL TSP) Indications

TUBE #	TSP #	Unadjusted V.610	Unadjusted V.630	Adjusted V.610	Adjusted V.630	610/630 Volts Ratio	610 - 630 Difference
R06C017	6	0.67	0.44	0.55	0.43	1.28	0.12
R07C053	3	0.88	0.82	0.73	0.80	0.91	-0.08
R08C096	4	0.39	0.34	0.32	0.33	0.97	-0.01
R08C109	4	0.50	0.52	0.41	0.51	0.81	-0.10
R09C012	2	0.44	0.52	0.36	0.51	0.71	-0.15
R09C088	2	0.46	0.53	0.38	0.52	0.73	-0.14
R11C007	4	0.64	0.52	0.53	0.51	1.04	0.02
R30C025	5	0.34	0.34	0.28	0.33	0.84	-0.05
R31C093	2	1.12	0.96	0.92	0.94	0.98	-0.01
R36C067	3	1.42	1.31	1.17	1.28	0.91	-0.11
R36C095	3	0.23	0.19	0.19	0.19	1.02	0.00
R38C088	2	0.46	0.45	0.38	0.44	0.86	-0.06
R40C096	5	1.01	0.85	0.83	0.83	1.00	0.00
R45C087	3	1.17	0.96	0.97	0.94	1.03	0.03
R48C088	6	0.73	0.60	0.60	0.59	1.03	0.02
R49C055	5	0.60	0.74	0.50	0.72	0.68	-0.23

Indices of Determination	
630 V to 610 V	91.1%
Volts Ratio to 610 Volts	7.05%
Volts Ratio to 630 Volts	0.05%
Volts Diff. to 610 Volts	1.4%
Volts Diff. to 630 Volts	3.3%

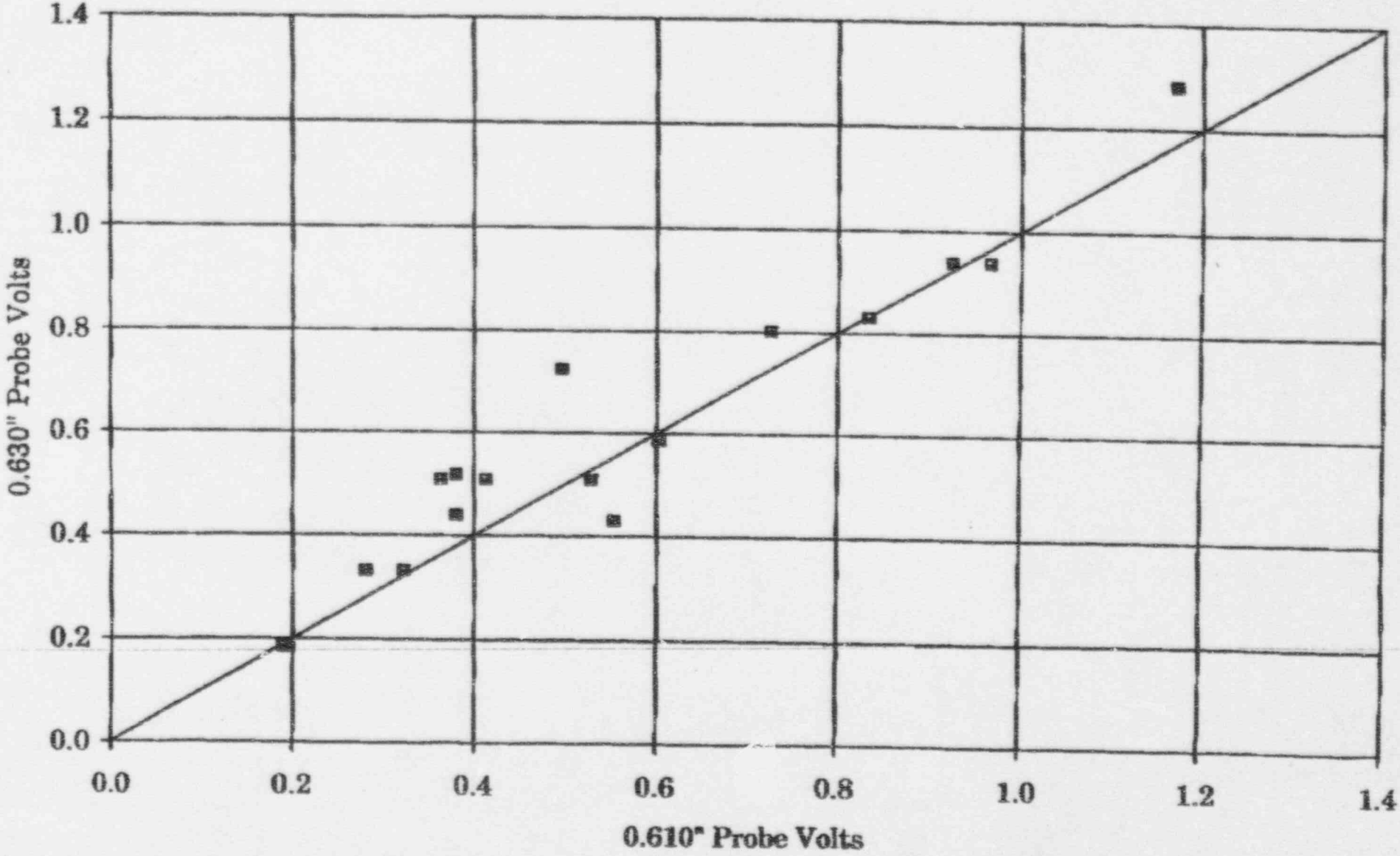
	610/630 Volts Ratio	610 - 630 Difference
Count	16	16
Average	0.93	-0.05
St Dev	0.15	0.08
Variance	0.02	0.01
Max	1.28	0.12
Min	0.68	-0.23
Median	0.94	-0.03

Transfer Standard Adjustment

Probe	Cal Std	Setup	Avg to Ref	Scale
Ref.	50416	2.75 V	#N/A	#N/A
610	50446	2.75 V	2.27 V	82.5%
630	50418	2.75 V	2.69 V	97.8%

Note: The data was normalized according to the "McGuire Unit 2 Analysis Guidelines", 2.75 volts on P1(550/130 kHz differential mix) on the four(4) 20% FBH's. All the indications measured and compared were based on the analysis results as reported during the McGuire Unit 2 RFO.

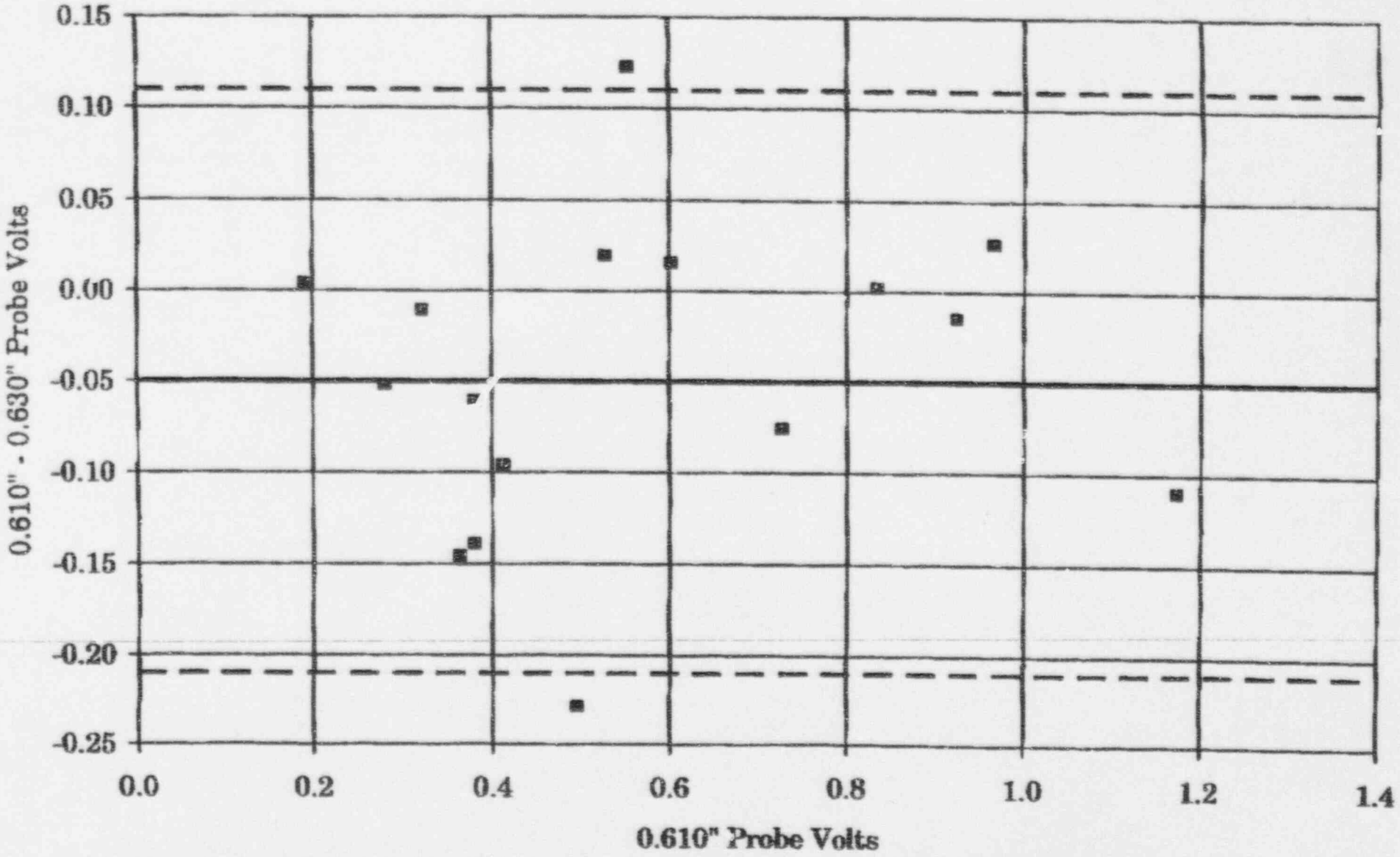
Comparison of 0.630" to 0.610" Diameter Probe Voltage Readings



Attachment 3

[V610630 XLS]610 630

Comparison of 0.630" to 0.610" Diameter Probes, Probe Voltage Differences



Attachment 4

ATTACHMENT B

Comparison of 0.630" Probe to 0.610" Probe

Bin 0, 0.00 <= V610 <= 0.59 Volts

Source Bin	Analysis Bin	SG	Row	Col	TSP	610 Offset	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
1	0	D	7	22	3	-0.03	0.05		0.52	0.60	-0.08	0.867
1	0	D	7	36	4	0.16	0.13		0.55	0.63	-0.08	0.873
1	0	D	8	11	2	-0.03	-0.05		0.26	0.22	0.04	1.182
1	0	D	8	46	2	0.07	0.08		0.54	0.48	0.06	1.125
1	0	D	9	22	4	0.08	0.05		0.41	0.66	-0.25	0.621
1	0	D	9	22	3	0.10	0.18		0.50	0.71	-0.21	0.704
2	0	D	9	22	2	0.08	0.13		0.58	0.54	0.04	1.074
3	0	D	9	69	4	0.15	0.08		0.52	0.46	0.06	1.130
3	0	D	9	100	2	0.11	0.17		0.27	0.45	-0.18	0.600
2	0	D	10	38	2	0.00	0.03		0.36	0.23	0.13	1.565
2	0	D	10	102	2	0.08	0.08		0.56	0.71	-0.15	0.789
1	0	D	11	40	6	0.08	0.13		0.48	0.53	-0.05	0.906
1	0	D	12	101	2	0.05	-0.05		0.49	0.60	-0.11	0.817
1	0	D	13	65	4	0.08	0.13		0.48	0.50	-0.02	0.960
2	0	D	15	59	4	0.08	0.18		0.52	0.62	-0.10	0.839
2	0	D	15	68	2	0.20	0.13		0.58	0.75	-0.17	0.773
1	0	D	16	46	4	0.18	0.15		0.59	0.54	0.05	1.093
2	0	D	16	60	2	0.10	0.00		0.56	0.76	-0.20	0.737
2	0	D	16	97	2	-0.01	-0.03		0.32	0.36	-0.04	0.889
1	0	D	32	54	4	-0.23	0.05		0.47	0.45	0.02	1.044
2	0	D	42	41	3	0.02	0.03		0.59	0.63	-0.04	0.937

Index of Determination		Count		21	21	21	21
		Average		0.48 V	0.54 V	-0.06 V	93.0%
		St Dev		0.10 V	0.15 V	0.11 V	22.1%
630V to 610V	50.76%	Variance		0.010	0.023	0.011	0.049
Delta V to 610V	0.24%	Max		0.59 V	0.76 V	0.13 V	1.565
Ratio to 610V	0.82%	Min		0.26 V	0.22 V	-0.25 V	0.600
		Median		0.52 V	0.54 V	-0.05 V	0.889

Comparison of 0.630" Probe to 0.610" Probe

Bin 1, 0.60 <= V610 <= 0.79 Volts

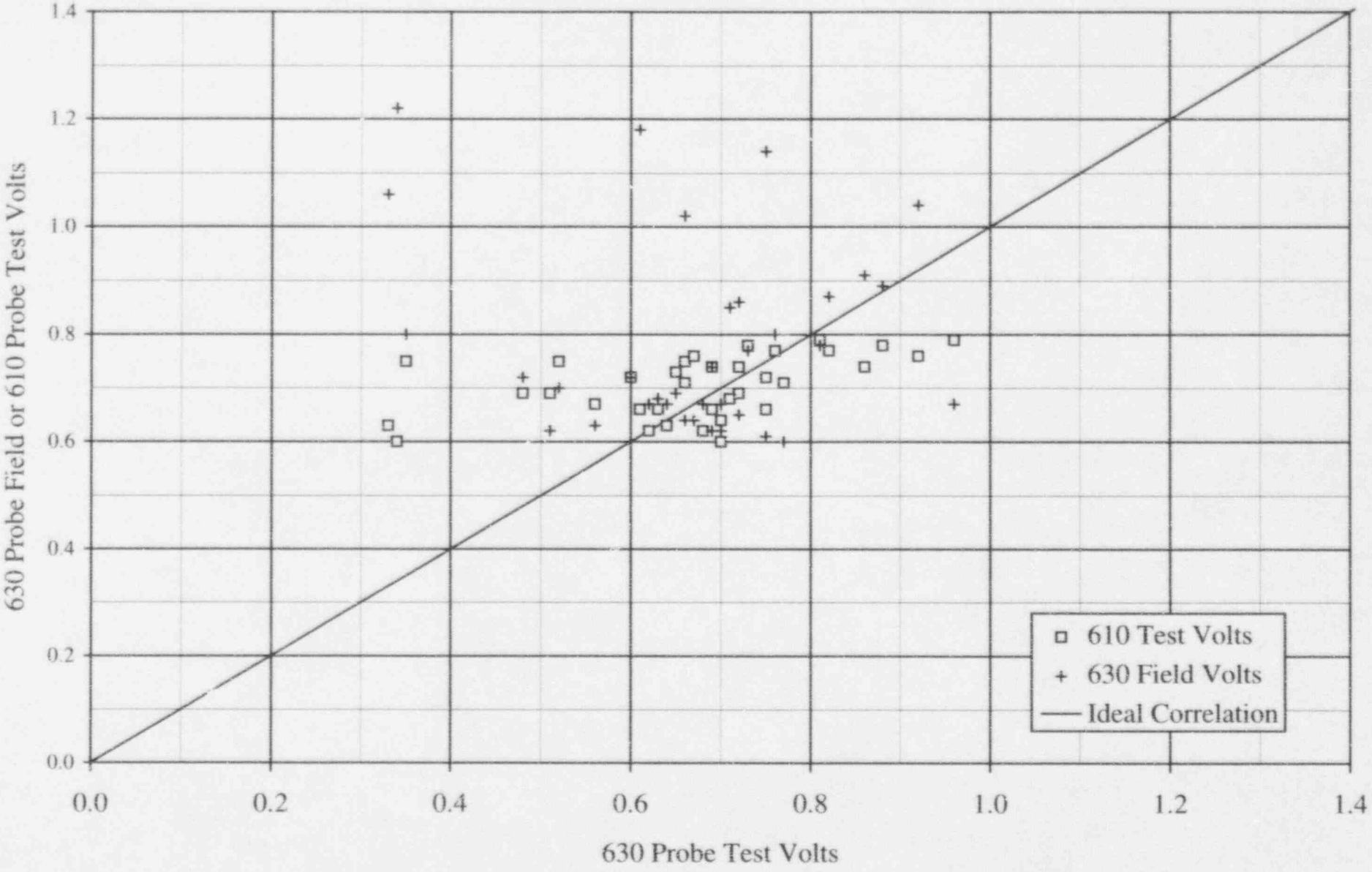
Source Bin	Analysis Bin	SG	Row	Col	TSP	610 Offset	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
3	1	C	12	53	2	0.09	0.08	1.14	0.66	0.75	-0.09	0.880
3	1	C	13	78	3	0.20	0.20	1.06	0.63	0.33	0.30	1.909
3	1	C	13	78	2	0.06	0.09	1.18	0.66	0.61	0.05	1.082
2	1	D	6	55	2	0.05	0.13	0.86	0.69	0.72	-0.03	0.958
1	1	D	7	22	4	0.05	0.05	0.67	0.62	0.68	-0.06	0.912
2	1	D	7	23	3	0.08	0.08	0.80	0.77	0.76	0.01	1.013
1	1	D	7	24	2	-0.03	0.08	0.67	0.79	0.96	-0.17	0.823
3	1	D	9	16	2	0.12	0.05	1.22	0.60	0.34	0.26	1.765
3	1	D	9	16	3	0.13	0.10	1.02	0.71	0.66	0.05	1.076
2	1	D	10	3	3	0.08	0.03	0.89	0.78	0.88	-0.10	0.886
1	1	D	11	44	3	0.05	0.08	0.67	0.63	0.64	-0.01	0.984
2	1	D	11	88	3	-0.29	0.23	0.91	0.74	0.86	-0.12	0.860
1	1	D	12	39	4	0.05	0.13	0.60	0.71	0.77	-0.06	0.922
1	1	D	12	39	2	0.11	0.08	0.70	0.75	0.52	0.23	1.442
1	1	D	12	59	3	0.03	0.05	0.62	0.66	0.69	-0.03	0.957
1	1	D	12	68	3	0.21	0.21	0.64	0.75	0.66	0.09	1.136
1	1	D	13	65	3	0.13	0.10	0.68	0.66	0.63	0.03	1.048
2	1	D	14	49	2	0.13	0.05	0.80	0.75	0.35	0.40	2.143
2	1	D	15	69	3	0.03	0.03	0.85	0.68	0.71	-0.03	0.958
1	1	D	17	56	3	0.18	0.08	0.62	0.69	0.51	0.18	1.353
1	1	D	21	5	2	0.24	0.21	0.77	0.78	0.73	0.05	1.068
1	1	D	22	36	4	0.16	0.10	0.67	0.62	0.62	0.00	1.000
1	1	D	22	50	3	0.00	0.08	0.64	0.76	0.67	0.09	1.134
3	1	D	22	89	2	0.02	-0.04	1.04	0.76	0.92	-0.16	0.826
2	1	D	23	104	3	0.18	0.26	0.87	0.77	0.82	-0.05	0.939
1	1	D	27	11	2	0.05	0.05	0.74	0.74	0.69	0.05	1.072
1	1	D	27	45	4	0.10	0.16	0.65	0.74	0.72	0.02	1.028
1	1	D	30	48	4	0.18	0.28	0.78	0.79	0.81	-0.02	0.975
1	1	D	38	56	7	-0.20	-0.15	0.72	0.69	0.48	0.21	1.438
1	1	D	39	39	4	-0.11	0.21	0.67	0.60	0.70	-0.10	0.857
1	1	D	39	53	7	-0.21	-0.21	0.62	0.64	0.70	-0.06	0.914
1	1	D	43	22	2	0.05	0.10	0.69	0.73	0.65	0.08	1.123
1	1	D	43	50	3	0.26	0.18	0.63	0.67	0.56	0.11	1.196
1	1	D	49	59	2	0.00	0.05	0.72	0.72	0.60	0.12	1.200
1	1	D	49	69	3	0.12	0.10	0.61	0.72	0.75	-0.03	0.960

Index of Determination	
630V to 630FV	1.48%
610V to 630FV	1.28%
630V to 610V	23.59%
Delta V to 610V	1.20%
Ratio to 610V	1.69%

	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
Count	35	35	35	35
Average	0.70 V	0.67 V	0.03 V	111.0%
St Dev	0.06 V	0.15 V	0.13 V	30.3%
Variance	0.003	0.022	0.017	0.092
Max	0.79 V	0.96 V	0.40 V	2.143
Min	0.60 V	0.33 V	-0.17 V	0.823
Median	0.71 V	0.69 V	0.01 V	1.013
Skew	-0.25	-0.56	0.92	2.05
Kurtosis	-1.14	0.59	0.74	4.17

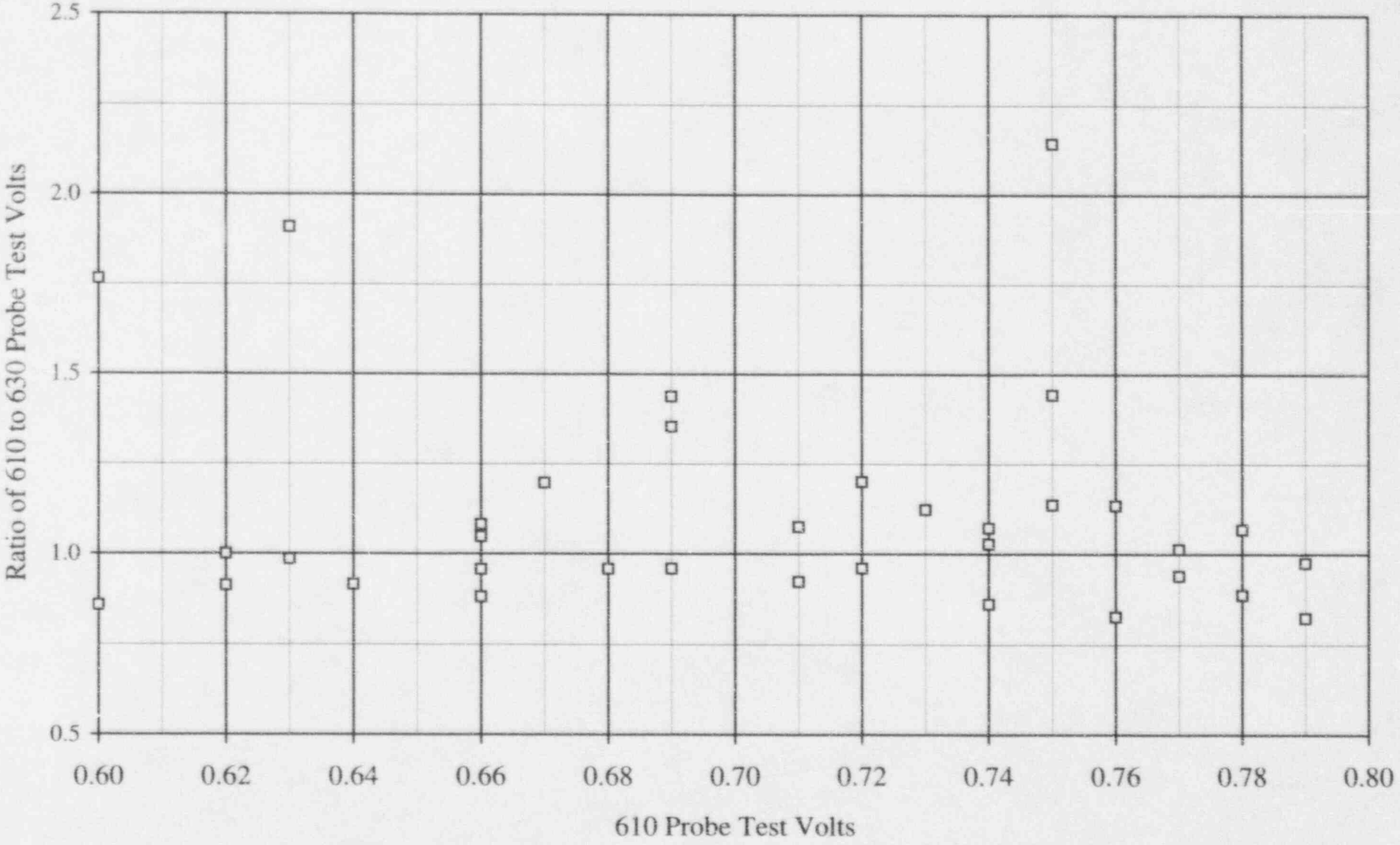
610 Probe Test & 630 Probe Field vs 630 Probe Test Volts

Bin 1, 0.6 V <= 610 Test Volts < 0.8 V



Comparison of Bin 1 630 to 610 Probe Volts

Ratio of 610 to 630 Volts vs. 610 Volts



Comparison of 0.630" Probe to 0.610" Probe

Bin 2, 0.80 <= V610 <= 0.99 Volts

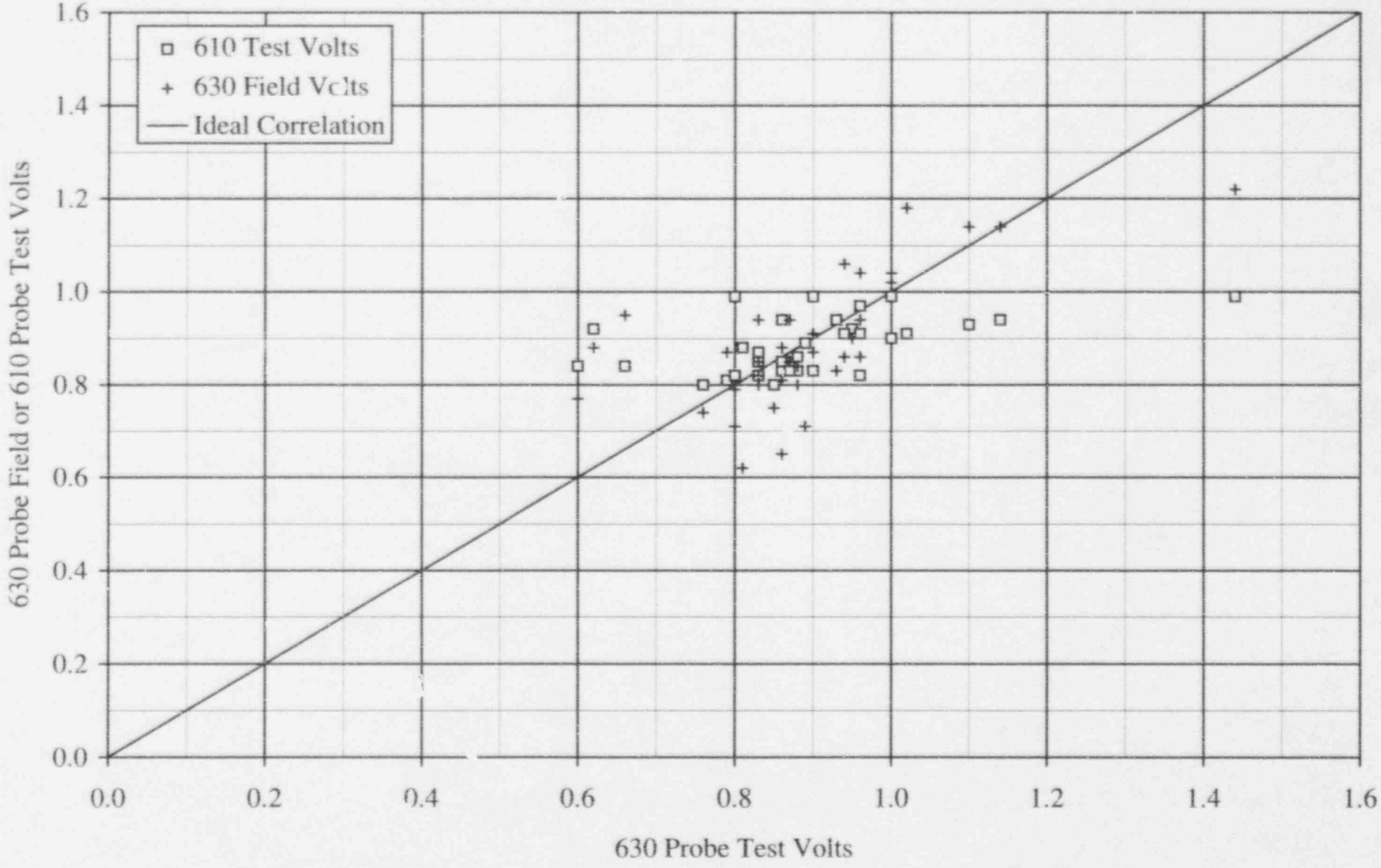
Source Bin	Analysis Bin	SG	Row	Col	TSP	610 Offset	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
3	2	C	10	109	3	0.25	0.00	1.14	0.94	1.14	-0.20	0.825
3	2	C	22	21	2	0.18	0.11	1.22	0.99	1.44	-0.45	0.688
2	2	D	6	47	3	0.17	0.15	0.86	0.91	0.94	-0.03	0.968
1	2	D	7	24	5	0.03	0.00	0.74	0.80	0.76	0.04	1.053
1	2	D	7	31	3	0.00	0.08	0.71	0.99	0.80	0.19	1.238
2	2	D	7	35	2	0.10	0.08	0.87	0.81	0.79	0.02	1.025
3	2	D	7	80	3	0.19	0.19	1.14	0.93	1.10	-0.17	0.845
1	2	D	7	86	2	0.63	0.18	0.65	0.83	0.86	-0.03	0.965
1	2	D	7	89	3	0.22	0.23	0.71	0.89	0.89	0.00	1.000
2	2	D	8	35	2	0.08	0.03	0 94	0.86	0.83	0.03	1.036
1	2	D	8	48	2	0.05	-0.08	0.62	0.88	0.81	0.07	1.086
3	2	D	8	57	2	0.10	0.15	1.04	0.82	0.96	-0.14	0.854
1	2	D	9	17	3	0.20	0.10	0.75	0.80	0.85	-0.05	0.941
2	2	D	10	101	3	0.18	0.18	0.81	0.82	0.83	-0.01	0.988
2	2	D	10	113	2	0.47	0.13	0.87	0.83	0.90	-0.07	0.922
2	2	D	11	63	4	0.05	0.00	0.90	0.92	0.95	-0.03	0.968
1	2	D	12	68	5	0.03	0.05	0.79	0.82	0.80	0.02	1.025
2	2	D	12	105	2	0.05	0.05	0.94	0.85	0.87	-0.02	0.977
2	2	D	13	88	3	-0.31	0.23	0.88	0.85	0.86	-0.01	0.988
2	2	D	14	63	2	0.23	0.21	0.86	0.91	0.96	-0.05	0.948
2	2	D	14	106	2	0.05	0.05	0.80	0.83	0.88	-0.05	0.943
2	2	D	16	67	2	0.08	0.08	0.83	0.94	0.93	0.01	1.011
2	2	D	16	94	3	0.30	0.31	0.95	0.84	0.66	0.18	1.273
2	2	D	17	40	4	0.09	0.10	0.82	0.82	0.83	-0.01	0.988
3	2	D	18	102	2	0.02	0.00	1.02	0.99	1.00	-0.01	0.990
2	2	D	19	26	2	0.02	0.08	0.81	0.94	0.86	0.08	1.093
2	2	D	22	51	2	0.11	0.08	0.88	0.92	0.62	0.30	1.484
3	2	D	24	106	2	0.15	0.00	1.06	0.91	0.94	-0.03	0.968
3	2	D	25	106	2	0.02	-0.32	1.04	0.90	1.00	-0.10	0.900
2	2	D	26	64	2	0.33	0.31	0.84	0.86	0.88	-0.02	0.977
1	2	D	29	15	3	0.07	0.15	0.77	0.84	0.60	0.24	1.400
2	2	D	29	29	2	0.04	0.03	0.80	0.87	0.83	0.04	1.048
2	2	D	29	93	2	0.05	0.10	0.85	0.85	0.83	0.02	1.024
2	2	D	29	94	2	-0.03	-0.05	0.94	0.97	0.96	0.01	1.010
2	2	D	30	104	2	0.08	0.13	0.91	0.99	0.90	0.09	1.100
2	2	D	35	16	2	0.07	0.13	0.85	0.83	0.87	-0.04	0.954
3	2	D	43	25	2	0.06	0.08	1.18	0.91	1.02	-0.11	0.892

Index of Determination	
630V to 630FV	46.18%
610V to 630FV	16.69%
630V to 610V	25.71%
Delta V to 610V	1.32%
Ratio to 610V	0.11%

	610 Offset	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
Count	37	37	37	37	37	37	37
Average	0.89 V	0.88 V	0.89 V	-0.01 V	101.1%		
St Dev	0.14 V	0.06 V	0.15 V	0.13 V	14.7%		
Variance	0.020	0.003	0.021	0.016	0.021		
Max	1.22 V	0.99 V	1.44 V	0.30 V	1.484		
Min	0.62 V	0.80 V	0.60 V	-0.45 V	0.688		
Median	0.86 V	0.87 V	0.87 V	-0.01 V	0.988		
Skew	0.582	0.440	1.286	-0.608	1.329		
Kurtosis	0.099	-0.962	5.140	4.116	3.448		

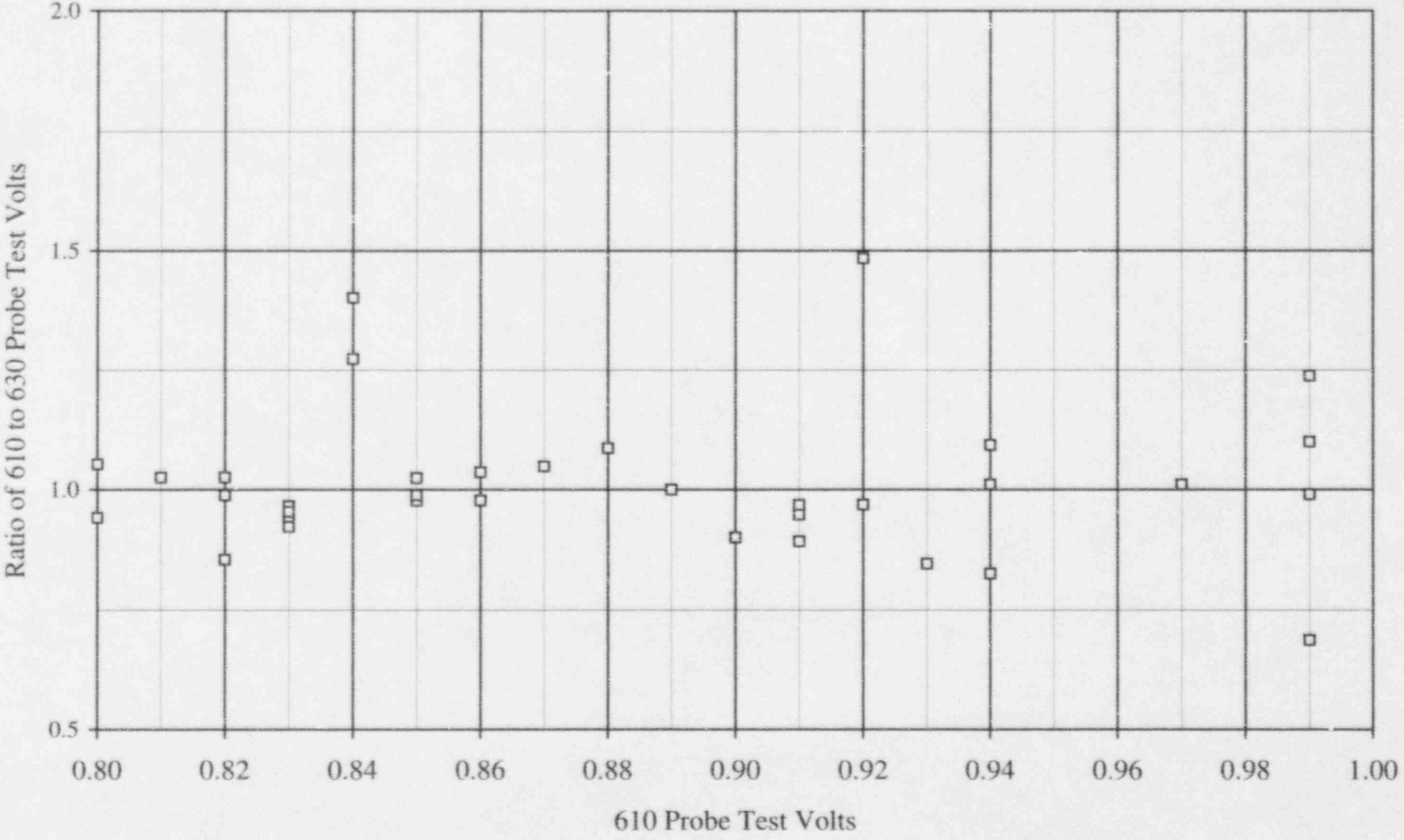
610 Probe Test & 630 Probe Field vs 630 Probe Test Volts

Bin 2, 0.8 V <= 610 Test Volts < 1.0 V



Comparison of Bin 2 630 to 610 Probe Volts

Ratio of 610 to 630 Volts vs. 610 Volts



Comparison of 0.630" Probe to 0.610" Probe

Bin 3, V610 >= 1.0 Volts

Source Bin	Analysis Bin	SG	Row	Col	TSP	610 Offset	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
3	3	C	6	12	2	-0.04	-0.02	1.05	1.22	1.03	0.19	1.184
3	3	C	6	22	2	0.06	0.02	1.10	1.39	1.23	0.16	1.130
3	3	C	6	49	3	-0.08	-0.04	1.16	1.32	1.18	0.14	1.119
3	3	C	6	51	3	0.00	0.03	1.01	1.27	1.07	0.20	1.187
3	3	C	6	63	3	0.03	0.01	1.12	1.35	1.11	0.24	1.216
3	3	C	6	64	3	-0.06	-0.06	1.06	1.14	1.06	0.08	1.075
3	3	C	6	67	4	0.03	-0.01	1.13	1.28	1.06	0.22	1.208
3	3	C	6	69	2	0.11	0.10	2.40	2.91	2.42	0.49	1.202
3	3	C	6	76	4	0.10	0.08	1.58	1.79	1.62	0.17	1.105
3	3	C	6	94	3	0.00	0.01	4.56	4.78	4.43	0.35	1.079
3	3	C	7	18	2	0.05	0.05	1.19	1.28	1.17	0.11	1.094
3	3	C	7	42	3	0.09	0.13	1.30	1.37	1.21	0.16	1.132
3	3	C	7	79	3	-0.02	0.00	1.21	1.34	1.30	0.04	1.031
3	3	C	7	84	2	-0.09	0.00	1.00	1.16	1.11	0.05	1.045
3	3	C	7	84	3	0.19	0.14	1.10	1.27	1.07	0.20	1.187
3	3	C	7	85	2	0.10	0.09	1.10	1.17	1.03	0.14	1.136
3	3	C	7	93	3	0.07	0.03	1.23	1.34	1.20	0.14	1.117
3	3	C	8	104	3	0.00	0.02	1.09	1.32	1.05	0.27	1.257
3	3	C	8	105	2	0.02	0.03	1.04	1.15	0.98	0.17	1.173
3	3	C	9	18	2	0.11	0.12	1.24	1.22	1.08	0.14	1.130
3	3	C	9	28	2	0.02	0.05	1.34	1.58	1.25	0.33	1.264
3	3	C	9	79	2	0.13	0.13	1.90	1.97	1.87	0.10	1.053
3	3	C	9	80	3	0.04	0.08	1.29	1.41	1.24	0.17	1.137
3	3	C	9	80	2	0.15	0.11	1.03	1.17	1.00	0.17	1.170
3	3	C	10	76	3	0.05	0.05	1.38	1.35	1.29	0.06	1.047
3	3	C	11	9	3	0.02	-0.06	1.17	1.28	1.20	0.08	1.067
3	3	C	11	10	2	0.09	0.11	2.13	2.46	1.95	0.51	1.262
3	3	C	11	11	3	0.00	0.13	1.19	1.75	1.38	0.37	1.268
3	3	C	11	17	3	0.05	0.05	1.13	1.27	1.12	0.15	1.134
3	3	C	11	69	2	0.07	0.07	1.59	1.72	1.39	0.33	1.237
3	3	C	12	12	2	0.07	0.15	1.33	1.59	1.36	0.23	1.169
3	3	C	12	13	2	0.02	-0.02	1.27	1.46	1.32	0.14	1.106
3	3	C	12	40	2	0.04	0.09	2.63	3.17	2.67	0.50	1.187
3	3	C	12	51	3	0.09	0.05	1.20	1.05	1.04	0.01	1.010
3	3	C	12	72	2	0.12	0.12	1.25	1.18	1.09	0.09	1.083
3	3	C	12	108	3	0.00	0.00	1.21	1.36	1.17	0.19	1.162
3	3	C	12	113	3	0.05	0.00	1.34	1.54	1.36	0.18	1.132
3	3	C	17	22	3	0.00	0.13	1.01	1.46	1.40	0.06	1.043
3	3	C	17	22	2	0.11	0.08	1.47	1.76	1.55	0.21	1.135
3	3	C	17	52	3	-0.02	-0.07	1.08	1.27	1.22	0.05	1.041
3	3	C	18	24	3	0.11	0.02	1.23	1.41	1.12	0.29	1.259
3	3	C	18	56	2	0.12	0.05	1.41	1.64	1.57	0.07	1.045
3	3	C	19	26	3	0.00	0.02	1.00	1.19	0.95	0.24	1.253
3	3	C	20	6	3	0.02	0.02	1.60	1.60	1.41	0.19	1.135
3	3	C	20	18	2	0.09	0.11	1.10	1.30	1.01	0.29	1.287
3	3	C	22	14	3	0.07	0.08	1.61	1.79	1.58	0.21	1.133
3	3	C	22	22	2	0.16	0.30	1.95	2.18	2.00	0.18	1.090
3	3	C	23	7	3	0.14	0.04	1.70	1.83	1.60	0.23	1.144
3	3	C	26	18	3	-0.18	0.06	2.46	2.93	2.44	0.49	1.201
3	3	C	30	23	3	-0.05	-0.02	1.17	1.34	1.18	0.16	1.136
3	3	C	32	58	3	0.07	0.07	1.01	1.09	0.96	0.13	1.135
3	3	C	34	18	3	0.19	0.06	1.02	1.27	1.22	0.05	1.041
3	3	C	38	70	3	0.05	0.05	1.32	1.41	1.33	0.08	1.060

Comparison of 0.630" Probe to 0.610" Probe

Bin 3, V610 >= 1.0 Volts

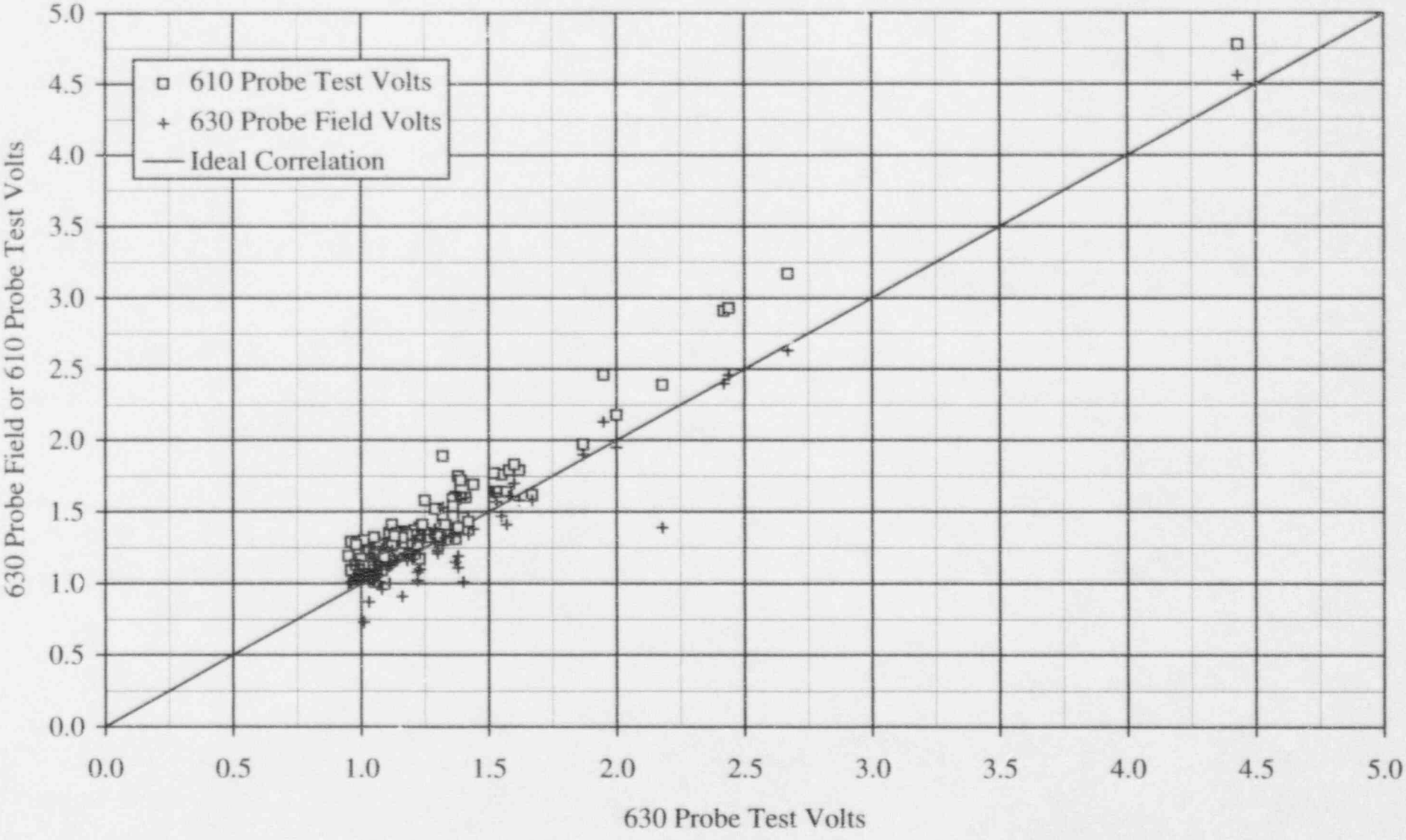
Source Bin	Analysis Bin	SG	Row	Col	TSP	610 Offset	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
3	3	C	39	68	3	0.16	0.16	1.15	1.34	1.13	0.21	1.186
3	3	C	42	70	2	0.16	0.16	1.18	1.20	1.05	0.15	1.143
3	3	C	42	87	3	0.09	0.09	1.38	1.69	1.44	0.25	1.174
3	3	C	43	46	3	0.09	0.08	1.15	1.36	1.37	-0.01	0.993
3	3	C	43	73	3	0.07	0.07	1.39	2.39	2.18	0.21	1.096
3	3	C	43	83	3	0.09	0.09	1.16	1.35	1.14	0.21	1.184
3	3	C	45	71	3	0.09	0.09	1.29	1.52	1.29	0.23	1.178
3	3	C	45	71	2	0.14	0.12	1.53	1.89	1.32	0.57	1.432
3	3	C	48	80	3	0.02	0.02	1.13	1.29	0.96	0.33	1.344
3	3	C	49	73	2	0.05	0.05	1.13	1.06	0.99	0.07	1.071
3	3	D	6	7	3	0.14	0.15	1.07	1.08	1.06	0.02	1.019
3	3	D	6	69	3	-0.08	-0.06	1.57	1.64	1.53	0.11	1.072
3	3	D	7	5	2	0.00	0.08	1.02	1.03	0.99	0.04	1.040
2	3	D	7	24	3	0.10	0.20	0.96	1.09	1.08	0.01	1.009
3	3	D	7	52	2	0.58	0.15	1.11	1.39	1.38	0.01	1.007
2	3	D	8	18	2	0.10	0.20	0.87	1.12	1.03	0.09	1.087
3	3	D	8	27	2	0.06	0.07	1.34	1.43	1.42	0.01	1.007
3	3	D	8	59	3	0.12	0.06	1.63	1.77	1.52	0.25	1.164
3	3	D	9	6	3	0.08	0.13	1.01	1.05	1.04	0.01	1.010
3	3	D	10	5	2	0.10	0.05	1.09	1.12	1.06	0.06	1.057
3	3	D	11	63	3	0.18	0.17	1.23	1.33	1.30	0.03	1.023
3	3	D	12	64	3	0.12	0.05	1.58	1.62	1.67	-0.05	0.970
2	3	D	13	60	3	-0.03	-0.08	0.91	1.32	1.16	0.16	1.138
3	3	D	14	48	2	0.07	0.10	1.01	1.01	1.05	-0.04	0.962
3	3	D	14	92	2	0.00	0.02	1.17	1.33	1.13	0.20	1.177
3	3	D	14	103	2	0.06	0.12	1.03	1.12	1.04	0.08	1.077
1	3	D	29	26	2	-0.10	-0.10	0.73	1.12	1.01	0.11	1.109
3	3	D	30	26	2	0.04	0.04	1.21	1.17	1.23	-0.06	0.951
3	3	D	32	66	2	0.14	0.12	1.64	1.31	1.37	-0.06	0.956
3	3	D	45	78	2	-0.06	-0.10	1.16	1.27	0.98	0.29	1.296

Index of Determination	
630V to 630FV	91.09%
610V to 630FV	90.62%
630V to 610V	95.21%
Delta V to 610V	35.63%
Ratio to 610V	3.24%

	630 Offset	630 Field V	610 Volts	630 Volts	610-630 Delta	610/630 Ratio
Count	83	83	83	83	83	83
Average	1.33 V	1.50 V	1.33 V	0.16 V	112.5%	
St Dev	0.49 V	0.55 V	0.49 V	0.13 V	9.2%	
Variance	0.244	0.306	0.236	0.018	0.009	
Max	4.56 V	4.78 V	4.43 V	0.57 V	1.432	
Min	0.73 V	1.01 V	0.95 V	-0.06 V	0.951	
Median	1.19 V	1.34 V	1.20 V	0.16 V	1.132	
Skew	4.03	3.44	3.85	0.88	0.51	
Kurtosis	22.51	15.76	20.33	1.05	0.54	

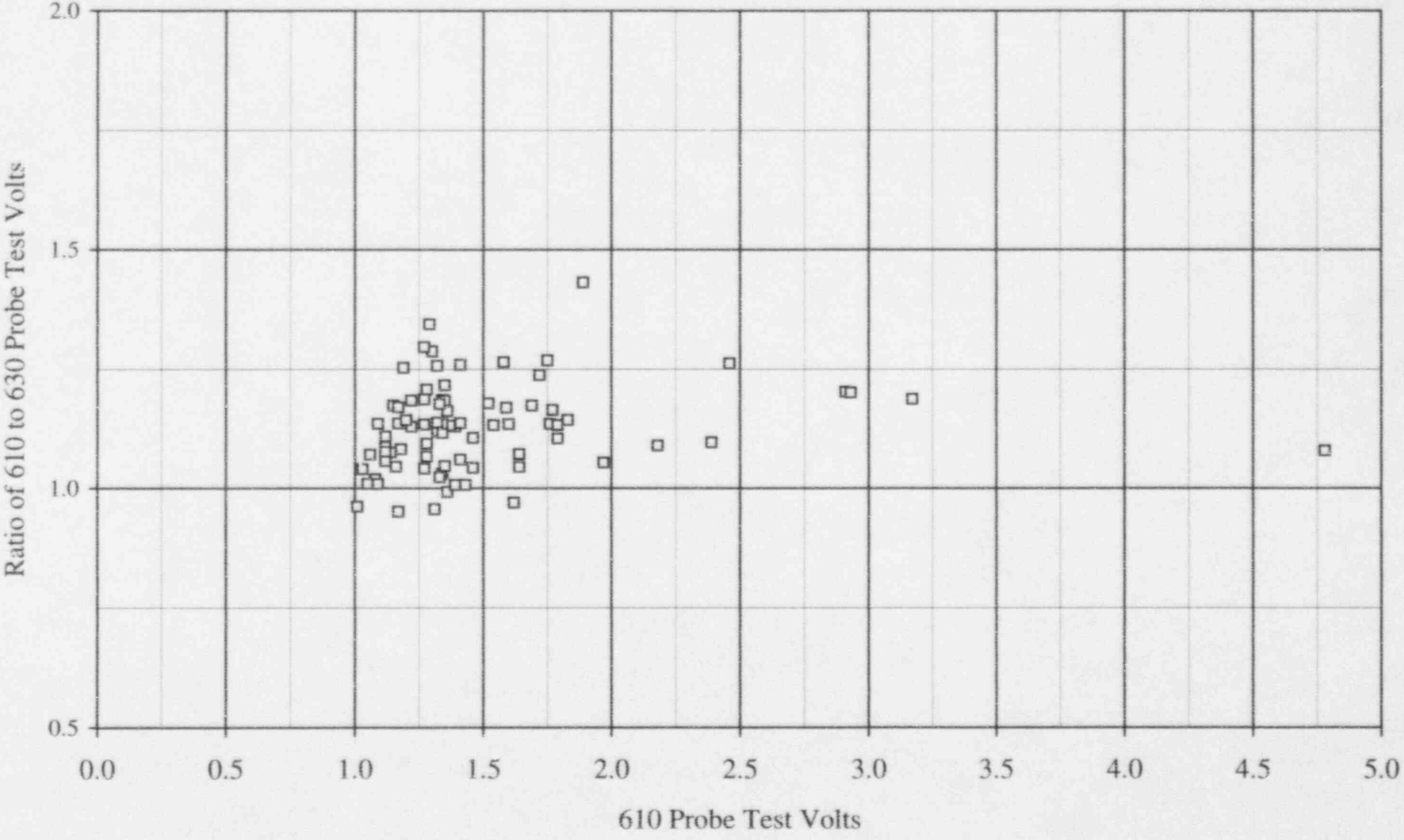
610 Probe Test & 630 Probe Field vs 630 Probe Test Volts

Bin 3, 1.0 V <= 610 Test Volts



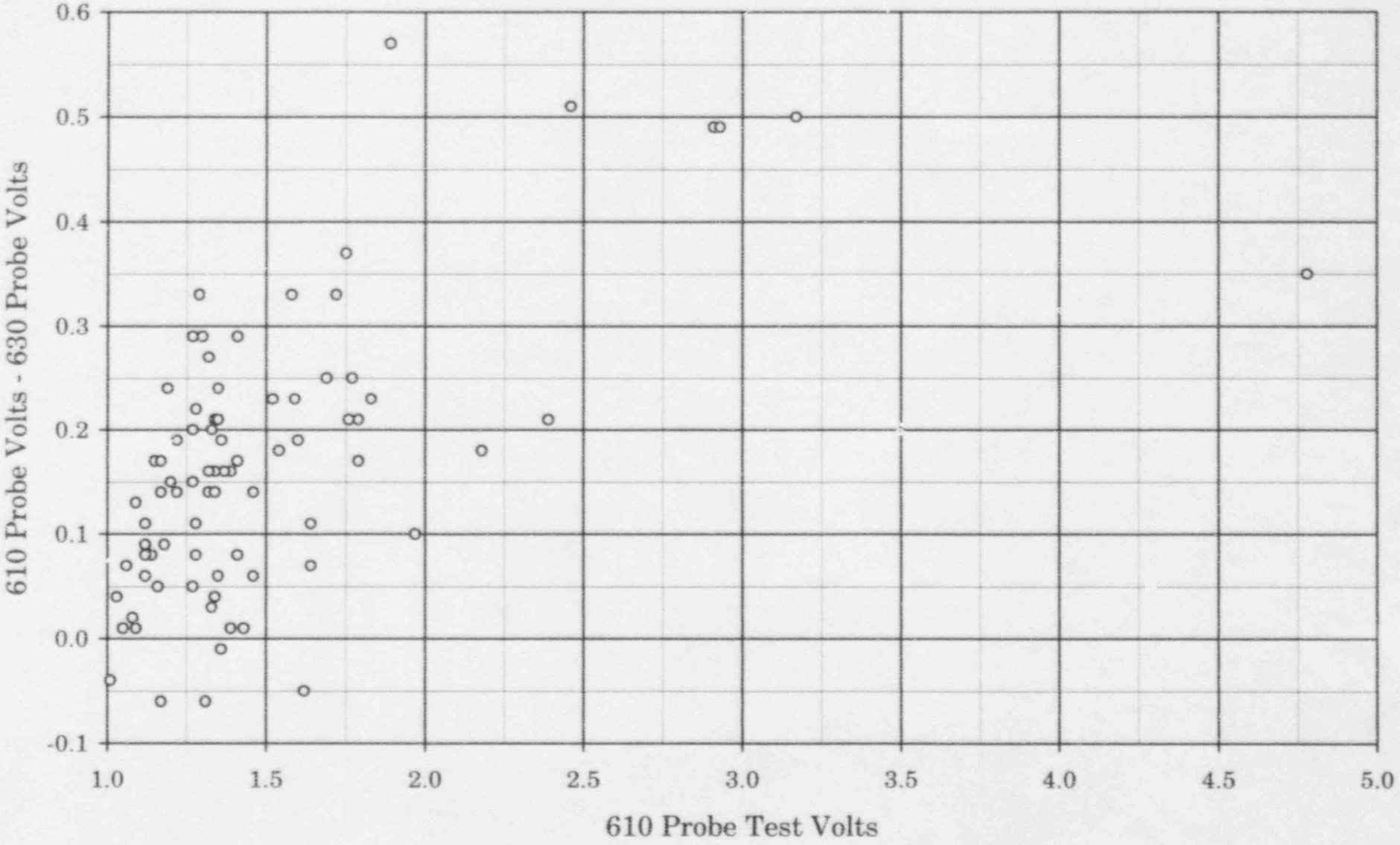
Comparison of Bin 3 630 to 610 Probe Volts

Ratio of 610 to 630 Volts vs. 610 Volts



Comparison of Bin 3 630 to 610 Probe Volts

610 Volts Minus 630 Volts



[V610630.XLS] Bin3.Del

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Comparison of 0.630" Probe to 0.610" Probe

Expert Evaluations

Source Bin	Analysis Bin	SG	Row	Col	TSP	P630	P610	P610-P630 Delta	P610/P630 Ratio
3	0	D	9	100	2	0.48	0.28	-0.20	0.58
2	2	D	22	51	2	0.42	0.35	-0.07	0.83
2	0	D	16	97	2	0.39	0.33	-0.06	0.85
3	2	D	43	25	2	1.02	0.89	-0.13	0.87
1	0	D	7	36	4	0.65	0.57	-0.08	0.88
3	3	D	9	6	3	0.36	0.32	-0.04	0.89
1	0	D	9	22	3	0.57	0.51	-0.06	0.89
2	1	D	10	3	3	0.90	0.82	-0.08	0.91
2	1	D	14	49	2	0.84	0.77	-0.07	0.92
3	2	D	25	106	2	0.99	0.91	-0.08	0.92
2	2	D	14	106	2	0.88	0.81	-0.07	0.92
1	0	D	8	46	2	0.63	0.58	-0.05	0.92
3	1	D	22	89	2	0.92	0.85	-0.07	0.92
2	0	D	15	59	4	0.47	0.44	-0.03	0.94
3	2	D	24	106	2	0.80	0.75	-0.05	0.94
1	1	D	12	59	3	0.69	0.65	-0.04	0.94
1	0	D	13	65	4	0.36	0.34	-0.02	0.94
1	1	D	13	65	3	0.36	0.34	-0.02	0.94
2	0	D	42	41	3	0.55	0.52	-0.03	0.95
1	2	D	7	31	3	0.93	0.88	-0.05	0.95
2	0	D	15	68	2	0.75	0.71	-0.04	0.95
1	1	D	49	69	3	0.75	0.71	-0.04	0.95
3	3	D	30	26	2	1.23	1.17	-0.06	0.95
1	2	D	9	17	3	0.84	0.80	-0.04	0.95
2	1	D	7	23	3	0.76	0.73	-0.03	0.96
1	2	D	7	86	2	0.81	0.78	-0.03	0.96
2	2	D	12	105	2	0.87	0.84	-0.03	0.97
2	2	D	8	35	2	0.90	0.87	-0.03	0.97
1	1	D	21	5	2	0.61	0.59	-0.02	0.97
1	1	D	22	36	4	0.62	0.60	-0.02	0.97
2	2	D	16	67	2	0.94	0.91	-0.03	0.97
2	2	D	14	63	2	0.96	0.93	-0.03	0.97
1	1	D	12	39	2	0.65	0.63	-0.02	0.97
3	3	D	14	48	2	1.04	1.01	-0.03	0.97
1	1	D	12	39	4	0.35	0.34	-0.01	0.97
2	3	D	8	18	2	0.78	0.76	-0.02	0.97
2	2	D	6	47	3	0.94	0.92	-0.02	0.98
1	0	D	11	40	6	0.53	0.52	-0.01	0.98
1	2	D	7	24	5	0.56	0.55	-0.01	0.98
1	0	D	9	22	4	0.66	0.65	-0.01	0.98
1	1	D	27	11	2	0.69	0.68	-0.01	0.99
1	1	D	30	48	4	0.81	0.80	-0.01	0.99
2	2	D	35	16	2	0.84	0.83	-0.01	0.99
2	2	D	29	94	2	0.96	0.95	-0.01	0.99
2	2	D	11	63	4	1.30	1.29	-0.01	0.99
3	3	D	11	63	3	1.30	1.29	-0.01	0.99
1	1	D	43	50	3	0.00	0.00	0.00	1.00
1	0	D	32	54	4	0.32	0.32	0.00	1.00

Comparison of 0.630" Probe to 0.610" Probe									
Expert Evaluations									
Source Bin	Analysis Bin	SG	Row	Col	TSP	P630	P610	P610-P630 Delta	P610/P630 Ratio
1	1	D	12	68	3	0.59	0.59	0.00	1.00
1	2	D	12	68	5	0.59	0.59	0.00	1.00
2	0	D	9	22	2	0.66	0.66	0.00	1.00
2	2	D	13	88	3	0.80	0.80	0.00	1.00
2	2	D	26	64	2	0.88	0.88	0.00	1.00
3	3	D	12	64	3	1.63	1.64	0.01	1.01
1	3	D	29	26	2	0.77	0.78	0.01	1.01
2	1	D	15	69	3	0.71	0.72	0.01	1.01
1	1	D	11	44	3	0.66	0.67	0.01	1.02
3	2	D	7	80	3	0.91	0.93	0.02	1.02
1	0	D	16	46	4	0.42	0.43	0.01	1.02
2	2	D	29	93	2	0.83	0.85	0.02	1.02
3	3	D	6	7	3	1.05	1.08	0.03	1.03
3	2	D	18	102	2	1.00	1.03	0.03	1.03
3	3	D	7	5	2	0.99	1.02	0.03	1.03
2	2	D	10	101	3	0.83	0.86	0.03	1.04
3	0	D	9	69	4	0.46	0.48	0.02	1.04
1	1	D	27	45	4	0.68	0.71	0.03	1.04
3	3	D	7	52	2	1.12	1.17	0.05	1.04
3	3	D	32	66	2	1.34	1.40	0.06	1.04
2	1	D	23	104	3	0.71	0.75	0.04	1.06
3	3	D	10	5	2	1.06	1.12	0.06	1.06
2	2	D	16	94	3	0.81	0.86	0.05	1.06
3	3	D	8	27	2	0.32	0.34	0.02	1.06
1	1	D	7	22	4	0.62	0.66	0.04	1.06
2	2	D	7	35	2	0.86	0.92	0.06	1.07
1	1	D	43	22	2	1.13	1.21	0.08	1.07
1	2	D	8	48	2	0.82	0.88	0.06	1.07
1	1	D	7	24	2	0.95	1.02	0.07	1.07
2	3	D	7	24	3	0.95	1.02	0.07	1.07
2	2	D	29	29	2	0.81	0.87	0.06	1.07
1	1	D	17	56	3	0.51	0.55	0.04	1.08
3	1	D	9	16	3	0.63	0.68	0.05	1.08
3	3	D	14	103	2	0.85	0.92	0.07	1.08
2	0	D	16	60	2	0.58	0.63	0.05	1.09
3	3	D	45	78	2	1.15	1.25	0.10	1.09
2	2	D	30	104	2	0.90	0.98	0.08	1.09
2	2	D	19	26	2	0.87	0.95	0.08	1.09
2	0	D	10	102	2	1.04	1.15	0.11	1.11
3	3	D	6	69	3	1.49	1.65	0.16	1.11
1	2	D	7	89	3	0.83	0.92	0.09	1.11
1	0	D	12	101	2	0.43	0.48	0.05	1.12
2	1	D	11	88	3	0.67	0.75	0.08	1.12
1	1	D	49	59	2	0.23	0.26	0.03	1.13
1	2	D	29	15	3	0.57	0.65	0.08	1.14
1	1	D	38	56	7	0.63	0.72	0.09	1.14
1	1	D	39	39	4	0.33	0.38	0.05	1.15
1	1	D	22	50	3	0.81	0.94	0.13	1.16

Comparison of 0.630" Probe to 0.610" Probe

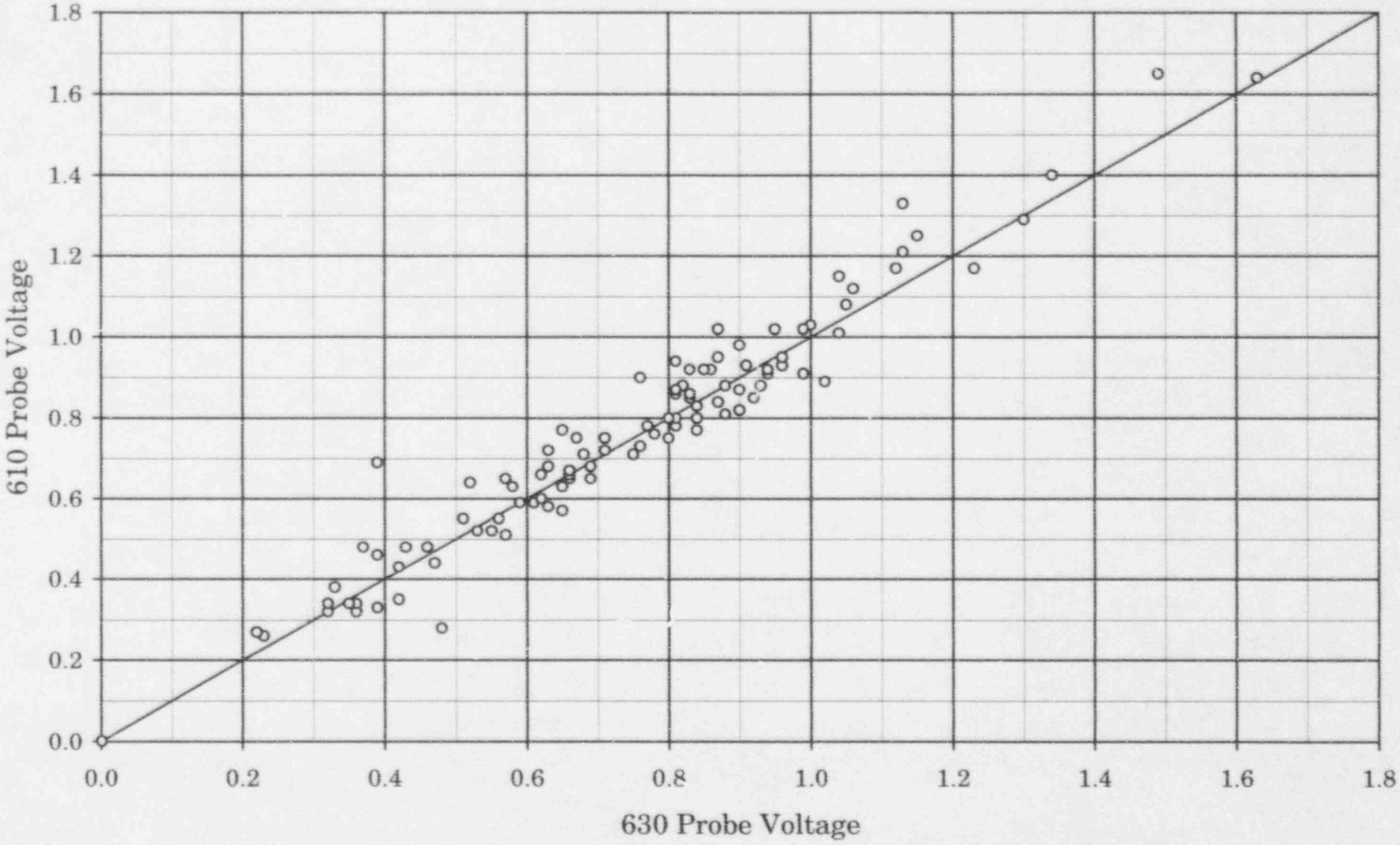
Expert Evaluations

Source Bin	Analysis Bin	SG	Row	Col	TSP	P630	P610	P610-P630 Delta	P610/P630 Ratio
2	3	D	13	60	3	0.87	1.02	0.15	1.17
3	3	D	14	92	2	1.13	1.33	0.20	1.18
3	1	D	9	16	2	0.39	0.46	0.07	1.18
2	2	D	17	40	4	0.76	0.90	0.14	1.18
2	2	D	10	113	2	0.65	0.77	0.12	1.18
1	0	D	8	11	2	0.22	0.27	0.05	1.23
1	1	D	39	53	7	0.52	0.64	0.12	1.23
2	0	D	10	38	2	0.37	0.48	0.11	1.30
2	1	D	6	55	2	0.39	0.69	0.30	1.77

Index of Determination		Count	105	105
630V to 610V	94.45%	Average	0.016	1.025
Delta V to 610V	9.17%	St Dev	0.069	0.121
Ratio to 610V	1.91%	Variance	0.005	0.015
		Max	0.300	1.769
		Min	-0.200	0.583
		Median	0.000	1.000
		Skew	0.675	1.952
		Kurtosis	2.562	14.000

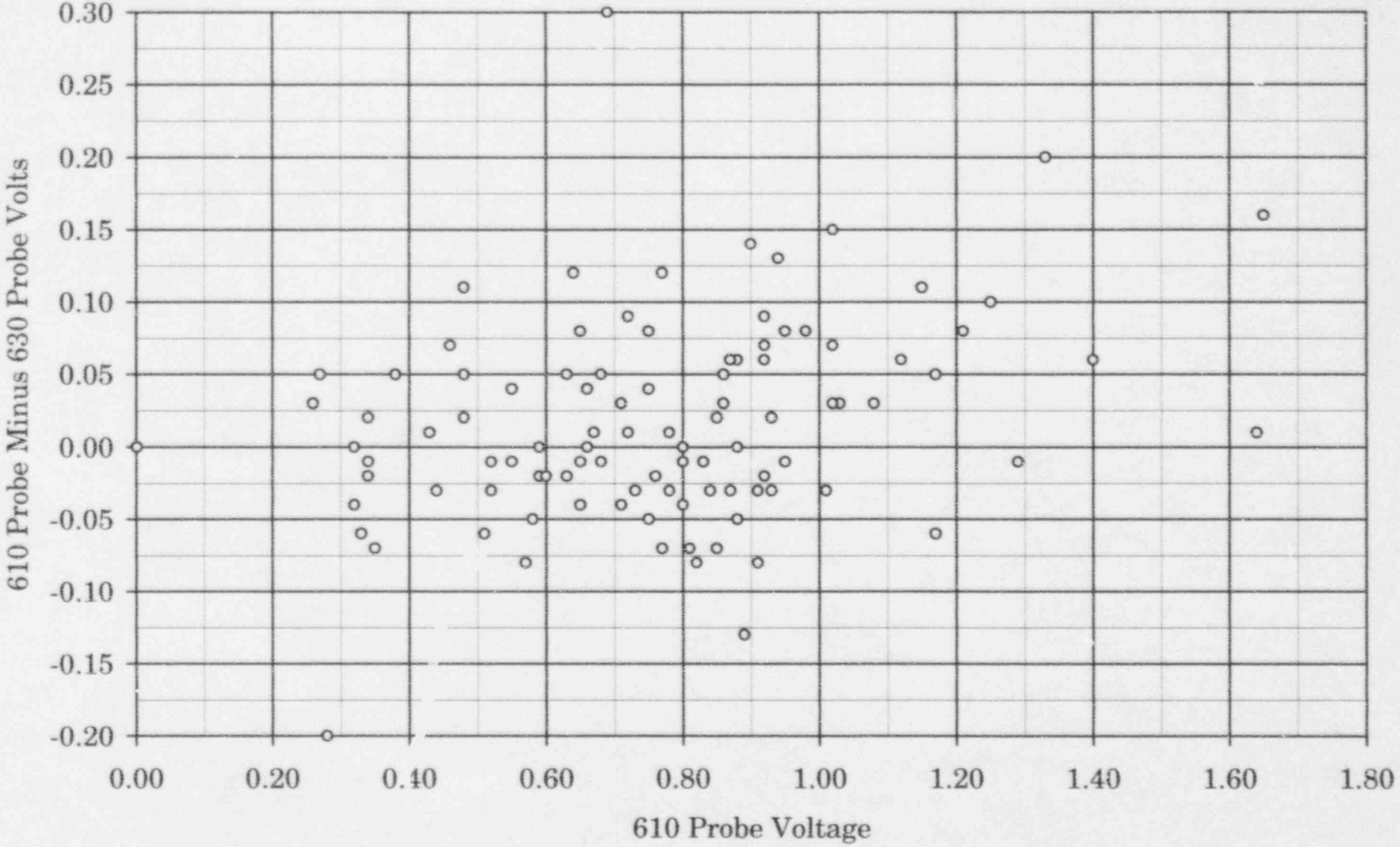
Comparison of 630 Probe to 610 Probe Volts

Expert Analyst Comparison



Expert Comparison of 630 to 610 Probe

Volts Difference vs. 610 Probe Volts



Expert Comparison of 630 Probe to 610 Probe

Ratio of 630 to 610 Volts vs. 610 Volts