FRAMATOME TECHNOLOGIES

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Title South Texas Project Unit 1 May 1996 1RE06 - 90-Day Report for Voltage-Based Repair Criterion for ODSCC at Tube Support Plates

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Reviewer is Independent.

Remarks:

The NRC Generic Letter 95-05 requires that certain information be submitted to the NRC within 90 days of each restart following a steam generator inspection in which the voltage-based repair criterion was applied. This document provides the requested information including the results of the leak rate and probability of burst calculations as well as the voltage distributions specified in the Generic Letter.

1.0 Introduction

Framatome Technologies, Inc. (FTI) has performed the qualification and justification for implementation of the voltage-based repair criterion for outside diameter stress corrosion cracking at tube support plates at Houston Lighting and Power's South Texas Project-Unit 1. This qualification followed the guidance provided in Generic Letter 95-05 and is documented in Reference 7.1. Implementation of the voltage-based repair criterion at South Texas Unit 1 has been approved by the NRC (Reference 7.6).

The May 1996 1RE06 eddy current inspection was the first inspection at the South Texas Project Unit 1 (STP-1) implementing the 1.0 volt alternate repair criterion (ARC). A full length bobbin coil inspection was performed on all in-service tubes during this outage. This report provides a summary of the bobbin and RPC inspection results as they relate to the ARC as well as the results of the tube integrity evaluation.

Tubes were removed from the South Texas Unit 1 steam generators during the September 1993 and March 1995 outages in support of obtaining approval of an alternate repair criterion. Per the Generic Letter, tubes should be removed on an on-going basis. The Generic Letter states that an additional pulled tube specimen should be obtained at the refueling outage following accumulation of 34 effective full power months of operation or at a maximum interval of three refueling outages, whichever is less. Therefore, no tubes were required to be removed during the May 1996 outage. The examination results for the tubes removed during the previous outages confirmed that axial ODSCC is the dominant degradation mechanism. These results are documented in Reference 7.1 and are, therefore, not repeated in this report.

2.0 ARC Database

EPRI has developed a database containing the testing information to support the ARC for ODSCC at tube support plates. The database includes burst pressure and leak rate data from pulled tubes and from model boiler specimens. The database used in conjunction with the tube integrity evaluation performed for this report is the latest available to HL&P and FTI via discussions with EPRI and Westinghouse. This database is documented in Reference 7.2.

This database includes the data from the tubes pulled from the STP-1 steam generators in 1993 and 1995. Also, as specified in the Generic Letter, the data meeting EPRI exclusion criteria 3a, 3b, or 3c were not excluded from the database and V.C. Summer tube R28C41 was included in the leak rate correlation with a leak rate of 2496 liters per hour.

From the burst and leak data in the 3/4" database, correlations between bobbin voltage and burst pressure, leak rate, and probability of leakage were developed. These correlations are given by the following equations:

$$BurstPressure(ksi) = 7.78009 - 3.062526 * \log(Volts) \qquad \text{Eq. 2-1}$$

$$LeakRate(l/hr) = 10^{-2.11291 + 3.31622 * \log(Volts)} \qquad \text{Eq. 2-2}$$

$$ProbabilityofLeakage = \frac{1}{1 + e^{5.172 - 8.670 * \log(Volts)}} \qquad \text{Eq. 2-3}$$

3.0 EOC6 Inspection Results

3.1 Summary of Results

The eddy current inspection performed at South Texas Unit 1 during May 1996 was the first inspection at South Texas implementing the 1.0 Volt Alternate Repair Criterion for ODSCC at Support Plates. During this outage, a full length bobbin coil inspection was performed on all in-service tubes in each steam generator.

From the bobbin inspection, a total of 1023 Distorted Support Indications (DSI's) were identified. All of these indications were located at hot leg tube support plates, i.e., no indications were detected at the flow distribution baffle plate (01H) or at cold leg TSP's. These indications were distributed among the four steam generators as shown in Table 3-1.

TABLE 3-1
Summary of 1RE06 As Found Results

	SG-A	SG-B	SG-C	SG-D	All SG's
No. Of DSI's	171	125	442	285	1023
DSI's 1.01 - 2.85 Volts	0	1	2	3	6
DSI's >2.85 Volts	0	0	0	0	0

Only six of the DSI's detected were greater than 1.0 volt. In accordance with the guidelines of the Generic Letter, all of the bobbin DSI's greater than 1.0 volt were inspected with RPC. Five of these indications were at the 02H support plate in their respective steam generators. None of these indications at 02H were confirmed with RPC. One DSI at the 09H support plate in SG-B was confirmed as a single volumetric indication (SVI) with RPC. This tube was removed from service as required by the Generic Letter. The largest bobbin DSI detected was in SG-D, Row 37, Column 32. This indication measured 1.58 volts but was not confirmed with RPC. Table 3-2 summarizes the bobbin and RPC results for the indications greater than 1.0 volt.

Table 3-2
Summary of Indications Greater Than 1.0 Volt

S/G	Row	Col	Location	Bobbin Call	Bobbin Volts	RPC Call
B	29	87	09H + 0.12	DSI	1.44	SVI
C	20	47	02H + 0.00	DSI	1.31	NDF
C	38	49	02H - 0.03	DSI	1.56	NDF
D	25	88	02H + 0.03	DSI	1.43	NDF
D	27	73	02H + 0.00	DSI	1.47	NDF
D	37	32	02H + 0.09	DSI	1.58	NDF

As required by the Generic Letter, an upper voltage repair limit was calculated prior to the inspection. The upper repair limit was determined to be 2.85 volts for STP-1 and is documented in Reference 7.1. Per the Generic Letter, any tubes with support plate indications attributable to ODSCC which have bobbin voltages greater than the upper repair limit must be repaired. As shown in Table 3-1, however, there were no DSI's above the upper voltage repair limit.

Generic Letter 95-05 states that intersections with the following signals must be inspected with RPC: dent signals greater than 5 volts; large mixed residuals that could cause a 1.0 volt bobbin signal to be missed or misread; and interfering signals from copper deposits. During the 1RE06 inspection, 61 dent signals greater than 5 volts were identified (23 in the hot leg and 38 in the cold leg). Two of the dent signals in the cold leg could not be inspected with RPC. These two tubes would not allow the passage of the RPC probe. Both of these tubes have a history of dents at these locations. Therefore, support plate degradation is assumed not to be the cause of these dents. Both of these tubes were plugged. The other 59 dents were inspected with RPC but none of these locations were confirmed as having any type of degradation. There were also three mixed residual indications identified from the bobbin inspection. These intersections were also inspected with RPC but none were confirmed. There were no intersections identified which had interfering signals from copper deposits.

The Generic Letter also states that the ARC does not apply to the flow distribution baffle plate intersections and to intersections where the tubes may potentially collapse or deform as a result of the combined postulated loss-of-coolant accident and safe shutdown earthquake loadings (e.g., intersections near the wedge supports at the upper TSP's). Therefore, all bobbin signals indicative of ODSCC which are detected at these locations must be inspected with RPC regardless of the bobbin voltage and any indications confirmed with RPC must be plugged. A finite element analysis was performed to determine the wedge locations which may potentially collapse under accident conditions. This analysis identified 124 tubes in each steam generator to be excluded from the ARC. These excluded wedge locations are documented in Reference 7.1. Only one bobbin indication was detected at a wedge location. This indication was less than 1.0 volt but was inspected with RPC due to the exclusion criteria. This indication was not confirmed with RPC and was, therefore, left in service. There were no bobbin indications detected at the flow distribution baffle plate intersections.

3.2 Average Growth of Indications

Per the Generic Letter, the more conservative of the plant-specific average growth rate or 30 percent per EFPY should be used in the determination of the upper voltage repair limit. The upper repair limit must be calculated prior to each outage. Although the upper voltage repair limit will not be calculated until shortly before the next inspection at South Texas-1, the average growth rates from Cycle 6 are documented in this report.

The voltage growth of the DSI's which were detected during the 1RE06 inspection was determined by comparing the 1RE06 data to the 1RE05 data for the same intersections. For those intersections where a call was not made during the 1RE05 inspection, the 1RE05 data was reviewed and, if possible, voltages were assigned to these intersections. In accordance with the Generic Letter, voltage growth rates were only evaluated for those intersections at which bobbin indications could be identified at both the 1RE05 and 1RE06 inspections. For this reason, the number of growth values used in the determination of the average growth rate (1018) is smaller than the total number of indications detected during 1RE06 (1023). Tables 3-4 through 3-7 at the end of this section show all of the DSI's detected during the 1RE06 inspection as well as their corresponding voltages. These tables also show the 1RE05 voltages and the change in voltage from 1RE05 to 1RE06. The indications designated as 'new' in the comments field are indications which were not originally called during the 1RE05 inspection. The 1RE05 voltages listed for these indications were obtained from the re-analysis as discussed above.

Due to the uncertainties in the eddy current process, some of the growth comparisons are expected to result in decreases in voltage. Per the Generic Letter, it is appropriate to consider these negative growth rates as part of the average growth rate. The use of the negative growth rates applies only when determining the upper voltage repair limit. For the determination of the growth distribution (Section 4.5) which is used in the projection of the EOC7 voltage distribution, the negative growth rates must be included as zero growth.

For the determination of the average growth rate, the growth values obtained from the actual 1RE05 and 1RE06 data were corrected for the Cycle 6 operating interval. Each growth value was divided by the cycle 6 operating interval of 1.059 EFPY so that the resulting values would be in terms of delta volts per EFPY. These corrected growth values were averaged and compared to the average BOC6 voltages to obtain the average percent growth per EFPY. This process yielded average growth rates of 9.6%, 32.6%, 4.0%, and 22.0% for A, B, C, and D steam generators, respectively. As shown, S/G B had the highest average growth (32.6%/EFPY). The average growth rate for S/G B, however, was based on a limited number of indications (125) and, therefore, is not considered to be a reliable growth rate. It is believed that, as more indications appear in S/G B, the growth rate will decrease until it is consistent with the growth rates observed in the other steam generators. The average growth of all steam generators combined was only 12.8% per EFPY which is well below the 30% per EFPY criterion. The Generic Letter specifies that the "plant-specific" average growth rate be considered when determining the upper voltage repair limit (in lieu of a "generator-specific" growth rate). Therefore, since the 12.8% average growth rate for all steam generators combined is less than the 30% per EFPY criterion, the 30% per EFPY growth rate should be used to calculate the upper repair limit for the next inspection. This data is summarized in Table 3-3.

Table 3-3
Average Growth Rates

S/G	Avg BOC6 Volts	Avg ΔV/EFPY	Avg % Growth/EFPY
A	0.365	0.0350	9.6%
B	0.290	0.0946	32.6%
C	0.344	0.0137	4.0%
D	0.310	0.0684	22.0%
All	0.331	0.0425	12.8%

TABLE 3-4
S/G A DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
2	54	03H	+0.09	0.49	0.54	-0.05	NEW
3	108	04H	-0.03	0.18	INR	N/A	NEW
9	119	05H	+0.09	0.33	0.29	0.04	NEW
15	15	04H	-0.03	0.55	0.67	-0.12	
16	17	03H	+0.06	0.18	0.08	0.1	NEW
16	26	04H	+0.06	0.17	0.38	-0.21	
16	28	04H	+0.00	0.25	0.26	-0.01	
16	93	02H	+0.06	0.64	0.33	0.31	
17	13	02H	-0.03	0.33	0.28	0.05	NEW
17	15	04H	+0.09	0.59	0.35	0.24	NEW
17	25	04H	+0.03	0.27	0.16	0.11	NEW
17	26	04H	+0.00	0.38	0.26	0.12	NEW
17	26	05H	+0.03	0.65	0.18	0.47	NEW
17	100	03H	+0.06	0.53	0.68	-0.15	
18	15	04H	-0.03	0.86	0.95	-0.09	
18	24	04H	+0.12	0.36	0.19	0.17	NEW
18	28	04H	+0.00	0.19	0.19	0	NEW
19	21	04H	+0.06	0.23	0.2	0.03	NEW
19	92	03H	+0.09	0.53	0.54	-0.01	
20	14	04H	+0.09	0.3	0.51	-0.21	NEW
20	24	04H	+0.00	0.43	0.45	-0.02	NEW
20	28	02H	+0.20	0.2	0.25	-0.05	NEW
20	28	04H	+0.06	0.35	0.3	0.05	
20	30	04H	+0.09	0.2	0.2	0	NEW
20	34	05H	+0.03	0.29	0.12	0.17	NEW
20	94	05H	+0.09	0.32	0.6	-0.28	NEW
21	16	04H	+0.06	0.57	0.36	0.21	
21	17	04H	+0.12	0.2	0.21	-0.01	NEW
21	21	02H	+0.0[illegible]	0.33	0.23	0.1	NEW
21	33	02H	+0.[illegible]	0.4	0.28	0.12	NEW
21	39	04H	-0.03	0.57	0.33	0.24	
21	87	03H	+0.15	0.19	0.19	-0.01	NEW
22	14	04H	-0.03	0.41	0.29	0.12	NEW
22	34	02H	+0.06	0.58	0.92	-0.34	
22	92	04H	-0.03	0.55	0.41	0.14	NEW
22	97	04H	+0.00	0.19	0.83	-0.64	
23	13	04H	+0.09	0.34	0.34	0	NEW
23	14	04H	+0.03	0.45	0.45	0	
23	23	02H	+0.03	0.18	0.36	-0.18	NEW
23	23	04H	+0.06	0.55	0.77	-0.22	NEW
23	30	02H	+0.03	0.33	0.27	0.06	
23	91	03H	-0.03	0.15	0.13	0.02	NEW
24	15	04H	+0.03	0.43	0.16	0.27	NEW
24	86	03H	+0.03	0.34	0.43	-0.09	NEW
25	13	04H	+0.00	0.37	0.3	0.07	NEW
25	16	04H	-0.03	0.65	0.36	0.29	NEW
25	18	02H	-0.03	0.48	0.33	0.15	NEW
25	39	04H	-0.00	0.33	0.25	0.08	
25	40	02H	-0.03	0.33	0.3	0.03	
25	48	02H	+0.12	0.29	0.3	-0.01	NEW

TABLE 3-4 (Cont'd)
S/G A DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
25	81	04H	+0.09	0.31	0.28	0.03	NEW
25	86	04H	+0.00	0.4	0.34	0.06	
25	87	03H	+0.15	0.39	0.34	0.05	
25	87	04H	+0.09	0.48	0.72	-0.24	NEW
26	92	04H	+0.06	0.41	0.35	0.06	NEW
26	17	03H	+0.06	0.26	0.34	-0.08	NEW
26	19	02H	+0.14	0.38	0.51	-0.13	NEW
26	73	03H	+0.00	0.63	0.42	0.21	
26	92	04H	+0.00	0.51	0.26	0.25	NEW
26	102	04H	+0.03	0.16	0.28	-0.12	NEW
27	19	05H	-0.03	0.17	0.18	-0.01	NEW
27	22	04H	+0.03	0.52	0.33	0.19	
27	22	05H	+0.03	0.33	0.26	0.07	
27	45	04H	+0.00	0.4	0.65	-0.25	NEW
27	62	02H	+0.09	0.47	0.56	-0.09	
27	62	03H	+0.00	0.88	0.78	0.1	NEW
27	73	04H	-0.03	0.56	0.34	0.22	NEW
27	85	04H	+0.06	0.18	0.14	0.04	NEW
27	86	03H	+0.03	0.19	0.22	-0.03	NEW
27	100	02H	+0.09	0.39	0.47	-0.08	NEW
28	14	03H	+0.03	0.92	1.05	-0.13	NEW
28	19	03H	+0.06	0.4	0.31	0.09	NEW
28	19	05H	+0.00	0.41	0.11	0.3	NEW
28	22	02H	+0.00	0.85	0.61	0.24	
28	29	04H	-0.03	0.25	0.66	-0.41	NEW
28	58	04H	-0.12	0.51	0.22	0.29	NEW
28	64	04H	+0.09	0.65	0.78	-0.13	
28	68	02H	+0.00	0.38	0.45	-0.07	NEW
28	72	03H	+0.15	0.54	0.55	-0.01	
28	81	04H	+0.06	0.15	0.06	0.09	NEW
28	86	04H	+0.00	0.46	0.46	0	NEW
28	99	03H	+0.00	0.17	0.25	-0.08	NEW
28	103	06H	+0.06	0.15	0.22	-0.07	NEW
28	104	06H	+0.09	0.08	0.16	-0.08	NEW
29	23	03H	+0.12	0.21	0.31	-0.1	NEW
29	49	04H	-0.06	0.41	0.25	0.16	
29	54	02H	+0.21	0.6	0.52	0.08	NEW
29	54	03H	+0.00	0.74	0.68	0.06	
29	62	02H	+0.06	0.6	0.53	0.07	
29	70	04H	-0.03	0.32	0.35	-0.03	NEW
29	95	02H	+0.06	0.38	0.29	0.09	NEW
29	100	03H	+0.03	0.32	0.13	0.19	NEW
29	103	04H	+0.03	0.18	0.15	0.03	NEW
29	104	04H	+0.03	0.23	0.21	0.02	NEW
30	16	03H	+0.00	0.66	0.47	0.19	NEW
30	16	04H	+0.03	0.43	0.24	0.19	NEW
30	22	04H	-0.03	0.16	0.22	-0.06	NEW
30	27	03H	+0.00	0.12	0.26	-0.14	NEW
30	55	02H	+0.09	0.4	0.3	0.1	NEW
30	55	04H	-0.15	0.58	0.19	0.39	NEW

TABLE 3-4 (Cont'd)
S/G A DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
30	70	04H	-0.03	0.63	0.98	-0.35	NEW
30	75	02H	-0.06	0.97	0.85	0.12	NEW
30	84	02H	+0.09	0.39	0.35	0.04	NEW
30	95	04H	+0.15	0.24	0.07	0.17	NEW
30	101	02H	+0.06	0.62	0.64	-0.02	NEW
31	17	03H	+0.18	0.63	0.26	0.37	NEW
31	17	04H	+0.00	0.43	0.48	-0.05	
31	32	03H	+0.03	0.24	0.15	0.09	NEW
31	34	04H	+0.00	0.39	0.33	0.06	
31	41	02H	+0.12	0.74	0.7	0.04	NEW
31	48	04H	+0.00	0.64	0.41	0.23	NEW
31	49	04H	+0.06	0.34	0.22	0.12	NEW
31	54	04H	+0.00	0.51	0.36	0.15	
31	55	02H	+0.09	0.5	0.65	-0.15	
31	72	03H	+0.03	0.64	0.54	0.1	NEW
31	73	02H	+0.06	0.41	0.28	0.13	NEW
31	91	05H	+0.09	0.34	0.2	0.14	NEW
32	15	03H	+0.00	0.47	0.34	0.13	NEW
32	19	04H	+0.00	0.6	0.3	0.3	NEW
32	25	05H	-0.03	0.19	0.11	0.08	NEW
32	28	04H	+0.00	0.1	0.31	-0.21	NEW
32	63	02H	+0.06	0.3	0.24	0.06	NEW
32	73	03H	+0.09	0.4	0.35	0.05	NEW
32	88	03H	+0.21	0.47	0.47	0	NEW
32	89	04H	+0.06	0.36	0.77	-0.41	NEW
32	92	04H	+0.00	0.42	0.22	0.2	NEW
32	101	03H	+0.06	0.24	0.24	0	NEW
33	17	04H	+0.00	0.34	0.27	0.07	
33	46	04H	-0.09	0.26	0.31	-0.05	NEW
33	73	02H	-0.03	0.69	0.33	0.36	NEW
33	87	04H	+0.12	0.56	0.44	0.12	
33	90	02H	+0.00	0.41	0.09	0.32	NEW
33	94	02H	+0.09	0.28	0.42	-0.14	NEW
33	94	03H	-0.03	0.59	0.53	0.06	
33	104	04H	-0.03	0.22	0.15	0.07	NEW
34	18	04H	+0.06	0.26	0.62	-0.36	NEW
34	35	02H	+0.06	0.25	0.15	0.1	NEW
34	44	04H	+0.12	0.31	0.44	-0.13	NEW
34	72	02H	+0.06	0.25	0.11	0.14	NEW
34	91	04H	+0.00	0.98	0.33	0.65	NEW
34	94	04H	+0.00	0.2	0.17	0.03	NEW
35	28	03H	+0.12	0.67	0.51	0.16	NEW
35	29	03H	+0.12	0.84	0.76	0.08	
35	29	04H	+0.03	0.52	0.3	0.22	NEW
35	86	03H	+0.06	0.25	0.42	-0.17	NEW
36	23	04H	+0.06	0.35	0.4	-0.05	
36	41	04H	-0.03	0.37	0.45	-0.08	NEW
36	86	03H	+0.09	0.21	0.3	-0.09	NEW
36	93	02H	+0.06	0.4	0.19	0.21	NEW
36	95	02H	+0.03	0.59	0.63	-0.04	NEW

TABLE 3-4 (Cont'd)
S/G A DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
37	54	03H	+0.03	0.54	0.42	0.12	NEW
37	58	04H	-0.06	0.29	0.23	0.06	NEW
37	65	04H	-0.06	0.46	0.31	0.15	NEW
37	67	04H	+0.03	0.4	0.25	0.15	
37	72	02H	-0.06	0.42	0.39	0.03	NEW
38	34	03H	+0.00	0.07	0.11	-0.04	NEW
38	34	04H	+0.09	0.43	0.39	0.04	
38	72	02H	+0.06	0.24	0.38	-0.14	NEW
39	31	04H	+0.06	0.29	0.25	0.04	
39	33	02H	+0.09	0.31	0.27	0.04	NEW
39	33	04H	+0.00	0.31	0.28	0.03	NEW
39	63	04H	+0.09	0.25	0.19	0.06	NEW
40	65	04H	-0.03	0.26	0.55	-0.29	
41	34	05H	+0.06	0.41	0.13	0.28	NEW
42	34	03H	+0.12	0.49	0.53	-0.04	
43	63	04H	+0.06	0.25	0.05	0.2	NEW
43	67	04H	+0.03	0.31	0.13	0.18	NEW
44	57	04H	+0.00	0.43	0.27	0.16	NEW
44	86	04H	+0.03	0.29	0.39	-0.1	NEW
45	65	04H	-0.09	0.36	0.07	0.29	NEW
47	34	03H	-0.03	0.4	0.77	-0.37	NEW

TABLE 3-5
S/G B DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
12	25	02H	+0.00	0.29	0.28	0.01	NEW
12	99	06H	+0.09	0.31	0.11	0.2	NEW
14	106	02H	+0.18	0.37	0.44	-0.07	
16	103	04H	+0.00	0.27	0.22	0.05	NEW
17	14	06H	+0.00	0.23	0.21	0.02	NEW
17	16	06H	-0.03	0.27	0.1	0.17	NEW
17	25	04H	+0.00	0.16	0.25	-0.09	NEW
17	102	02H	+0.09	0.93	0.46	0.47	
17	102	03H	+0.09	0.62	0.5	0.12	
18	10?	03H	+0.15	0.45	0.44	0.01	
19	15	04H	-0.09	0.74	0.39	0.35	NEW
19	27	04H	+0.00	0.19	0.1	0.09	NEW
21	18	02H	+0.00	0.56	0.39	0.17	
21	26	02H	+0.03	0.41	0.57	-0.16	
21	34	05H	-0.03	0.22	0.16	0.06	NEW
21	37	05H	+0.09	0.16	0.17	-0.01	NEW
21	92	02H	+0.06	0.28	0.27	0.01	
21	92	03H	+0.18	0.39	0.3	0.09	
21	95	02H	+0.09	0.41	0.37	0.04	
21	95	03H	+0.06	0.42	0.26	0.16	NEW
21	97	02H	+0.03	0.5	0.27	0.23	NEW
21	104	02H	+0.00	0.44	0.55	-0.11	
22	94	03H	+0.09	0.25	0.24	0.01	NEW
23	24	02H	-0.06	0.18	0.26	-0.08	NEW
23	24	04H	-0.12	0.44	0.5	-0.06	NEW
23	36	04H	-0.06	0.28	0.24	0.04	
23	91	02H	+0.09	0.26	0.24	0.02	
23	92	02H	+0.15	0.53	0.24	0.29	NEW
23	93	02H	+0.06	0.46	0.37	0.09	
23	95	02H	-0.06	0.21	0.17	0.04	
23	98	02H	+0.09	0.29	0.14	0.15	NEW
23	104	02H	-0.06	0.74	0.71	0.03	NEW
24	44	04H	+0.03	0.51	0.22	0.29	
25	35	02H	+0.09	0.49	0.34	0.15	
25	51	04H	-0.03	0.31	0.17	0.14	NEW
25	98	02H	+0.00	0.24	0.13	0.11	NEW
25	103	02H	+0.00	0.25	0.23	0.02	NEW
26	29	04H	-0.09	0.65	0.33	0.32	NEW
26	29	05H	+0.00	0.6	0.49	0.11	NEW
26	35	05H	+0.09	0.22	0.19	0.03	NEW
26	40	02H	+0.06	0.56	0.47	0.09	
26	47	02H	-0.12	0.26	0.25	0.01	NEW
26	50	04H	+0.03	0.23	0.12	0.11	NEW
26	52	02H	+0.06	0.87	0.63	0.24	
26	53	02H	+0.15	0.51	0.66	-0.15	
26	55	02H	+0.00	0.56	0.26	0.3	NEW
26	63	02H	+0.09	0.75	0.24	0.51	NEW
26	63	03H	+0.21	0.75	0.58	0.17	NEW
26	66	04H	+0.00	0.22	0.37	-0.15	
26	67	02H	+0.09	0.18	0.07	0.11	NEW/PLUGGED

TABLE 3-5 (Cont'd)
S/G B DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
26	67	04H	+0.03	0.33	0.34	-0.01	PLUGGED
26	96	02H	+0.03	0.27	0.17	0.1	NEW
27	28	04H	-0.06	0.33	0.18	0.15	NEW
27	29	04H	+0.00	0.13	0.26	-0.13	NEW
27	35	03H	+0.03	0.29	0.34	-0.05	NEW
27	47	04H	-0.12	0.22	0.07	0.15	NEW
27	52	02H	+0.06	0.48	0.45	0.03	
27	52	04H	+0.03	0.38	0.38	0	NEW
27	55	02H	+0.03	0.38	0.12	0.26	NEW
27	65	04H	-0.06	0.53	0.18	0.35	NEW
27	100	02H	+0.03	0.33	0.21	0.12	NEW
27	107	02H	+0.03	0.63	0.42	0.21	NEW
28	46	05H	+0.09	0.16	0.1	0.06	NEW
28	50	04H	+0.03	0.56	0.45	0.11	NEW
28	53	02H	+0.12	0.5	0.18	0.32	NEW
28	55	03H	+0.12	0.59	0.35	0.24	NEW
28	66	02H	+0.06	0.44	0.73	-0.29	
28	67	04H	+0.03	0.54	0.62	-0.08	
28	68	03H	+0.03	0.31	0.35	-0.04	
29	34	02H	+0.09	0.32	0.26	0.06	NEW
29	37	04H	+0.06	0.71	0.38	0.33	NEW
29	47	02H	-0.03	0.16	0.05	0.11	NEW
29	54	02H	+0.06	0.39	0.38	0.01	
29	87	09H	+0.12	1.44	1.33	0.11	PLUGGED
29	92	03H	-0.09	0.52	0.29	0.23	
29	98	02H	+0.06	0.35	0.22	0.13	NEW
30	50	05H	+0.12	0.28	0.11	0.17	NEW
30	53	03H	+0.00	0.42	0.15	0.27	NEW
30	53	04H	+0.06	0.52	0.18	0.34	NEW
30	95	02H	+0.00	0.33	0.22	0.11	NEW
30	96	02H	+0.06	0.62	0.42	0.2	NEW
30	96	04H	+0.06	0.36	0.25	0.11	NEW
30	101	02H	+0.00	0.19	0.26	-0.07	
31	31	04H	+0.12	0.12	0.14	-0.02	NEW
31	37	02H	+0.06	0.19	0.17	0.02	NEW
31	45	06H	+0.06	0.37	0.17	0.2	NEW
31	56	03H	+0.09	0.41	0.18	0.23	NEW
31	93	03H	+0.06	0.39	0.35	0.04	
32	33	04H	+0.00	0.38	0.2	0.18	NEW
32	43	02H	+0.06	0.6	0.22	0.38	NEW
32	87	02H	+0.00	0.66	0.42	0.24	NEW
32	106	02H	-0.03	0.57	0.72	-0.15	
33	34	02H	+0.09	0.18	0.21	-0.03	NEW
33	34	03H	+0.00	0.22	0.28	-0.06	
33	34	05H	+0.09	0.28	0.1	0.18	NEW
34	83	04H	+0.06	0.22	0.23	-0.01	NEW
34	91	04H	+0.15	0.43	0.3	0.13	NEW
34	92	02H	+0.09	0.41	0.16	0.25	NEW
34	92	03H	+0.03	0.29	0.26	0.03	NEW
35	29	05H	+0.00	0.38	0.25	0.13	NEW

TABLE 3-5 (Cont'd)
S/G B DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
35	30	02H	+0.03	0.17	0.13	0.04	NEW
35	32	04H	+0.12	0.36	0.35	0.01	
35	90	04H	-0.03	0.27	0.18	0.09	NEW
36	33	03H	+0.06	0.38	0.51	-0.13	
36	45	05H	+0.22	0.44	0.1	0.34	NEW
36	48	06H	+0.00	0.34	0.19	0.15	NEW
36	67	03H	+0.06	0.33	0.25	0.08	NEW
36	96	02H	+0.06	0.34	0.2	0.14	NEW
36	96	04H	-0.03	0.27	0.1	0.17	NEW
37	33	04H	+0.09	0.18	0.36	-0.18	
37	38	04H	+0.09	0.21	0.14	0.07	NEW
38	93	02H	+0.18	0.22	0.24	-0.02	NEW
39	28	04H	+0.12	0.19	0.2	-0.01	NEW
39	34	02H	+0.00	0.22	0.23	-0.01	
39	54	02H	-0.03	0.29	0.32	-0.03	NEW
40	45	05H	+0.16	0.44	0.16	0.28	NEW
40	48	04H	+0.00	0.35	0.22	0.13	NEW
40	66	03H	+0.06	0.27	0.23	0.04	NEW
42	50	04H	+0.00	0.27	0.19	0.08	NEW
42	62	04H	-0.03	0.5	0.16	0.34	
42	65	02H	+0.06	0.57	0.43	0.14	
43	31	04H	+0.06	0.14	0.2	-0.06	NEW
44	40	04H	+0.03	0.3	0.17	0.13	NEW
44	49	04H	+0.00	0.23	0.25	-0.02	NEW
46	56	02H	+0.09	1	0.35	0.65	NEW

TABLE 3-6
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
7	68	03H	+0.06	0.16	0.1	0.06	NEW
9	11	02H	+0.06	0.51	0.43	0.08	NEW
9	108	02H	+0.03	0.29	0.27	0.02	NEW
10	20	04H	+0.00	0.23	0.21	0.02	NEW
11	19	04H	+0.12	0.15	0.22	-0.07	NEW
12	27	04H	+0.06	0.11	0.09	0.02	
13	16	03H	+0.03	0.38	0.35	0.03	
13	18	04H	+0.00	0.21	0.37	-0.16	NEW
13	30	02H	+0.03	0.72	0.64	0.08	
13	58	03H	+0.00	0.27	0.3	-0.03	
13	75	02H	+0.15	0.39	0.3	0.09	NEW
13	102	02H	-0.03	0.21	0.27	-0.06	
13	103	02H	+0.06	0.46	0.76	-0.3	
14	14	04H	+0.00	0.32	0.27	0.05	NEW
14	15	03H	+0.06	0.33	0.27	0.06	
14	17	02H	+0.03	0.21	0.57	-0.36	
14	17	03H	-0.03	0.23	0.39	-0.16	NEW
14	93	02H	+0.15	0.43	0.25	0.18	NEW
14	94	02H	+0.06	0.83	0.31	0.52	
14	95	02H	-0.03	0.33	0.17	0.16	NEW
14	98	02H	+0.06	0.72	0.73	-0.01	
15	11	02H	-0.03	0.36	0.33	0.03	NEW
15	11	04H	+0.06	0.54	0.57	-0.03	NEW
15	13	02H	-0.03	0.34	0.5	-0.16	NEW
15	15	02H	+0.03	0.2	0.21	-0.01	NEW
15	15	03H	+0.06	0.15	0.23	-0.08	NEW
15	19	04H	+0.06	0.3	0.25	0.05	NEW
15	24	02H	+0.03	0.32	0.44	-0.12	NEW
15	25	02H	+0.00	0.27	0.39	-0.12	
15	26	04H	+0.00	0.3	0.24	0.06	NEW
15	29	02H	+0.09	0.44	0.46	-0.02	
15	29	04H	+0.12	0.43	0.25	0.18	NEW
15	32	03H	+0.06	0.68	0.24	0.44	
15	33	02H	+0.06	0.5	0.62	-0.12	
15	95	02H	+0.15	0.41	0.35	0.06	
15	102	02H	+0.00	0.19	0.17	0.02	
15	104	02H	+0.03	0.25	0.34	-0.09	
16	21	03H	+0.06	0.41	0.49	-0.08	
16	88	02H	-0.03	0.29	0.29	0	NEW
16	94	02H	-0.09	0.28	0.12	0.16	
16	96	03H	+0.09	0.69	0.54	0.15	
16	97	02H	+0.09	0.32	0.27	0.05	NEW
16	103	02H	+0.09	0.35	0.15	0.2	NEW
16	105	04H	+0.06	0.22	0.23	-0.01	
16	109	02H	+0.03	0.3	0.37	-0.07	
16	111	06H	+0.09	0.15	0.15	0	NEW
17	24	04H	+0.06	0.4	0.55	-0.15	NEW
17	25	02H	+0.03	0.64	0.33	0.31	
17	26	02H	+0.00	0.58	0.59	-0.01	
17	29	04H	-0.15	0.44	0.32	0.12	NEW

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
17	30	03H	+0.12	0.38	0.32	0.06	
17	100	03H	+0.03	0.26	0.45	-0.19	
18	12	02H	+0.06	0.47	0.17	0.3	NEW
18	14	02H	+0.00	0.28	0.23	0.05	
18	17	02H	-0.06	0.2	0.17	0.03	NEW
18	17	04H	+0.06	0.14	0.3	-0.16	NEW
18	24	02H	-0.03	0.55	0.29	0.26	
18	25	02H	+0.00	0.45	0.38	0.07	NEW
18	27	02H	+0.09	0.51	0.3	0.21	
18	27	03H	+0.03	0.45	0.23	0.22	
18	27	04H	+0.06	0.46	0.28	0.18	
18	28	02H	+0.09	0.24	0.13	0.11	
18	32	04H	+0.06	0.2	NDD	N/A	NEW
18	91	04H	+0.09	0.26	0.13	0.13	NEW
18	94	02H	+0.03	0.31	0.23	0.08	
18	96	02H	+0.20	0.18	0.07	0.11	NEW
18	97	02H	+0.12	0.41	0.32	0.09	NEW
18	97	03H	+0.00	0.32	0.3	0.02	NEW
18	105	03H	+0.03	0.19	0.19	0	NEW
19	10	03H	+0.00	0.66	0.37	0.29	NEW
19	13	03H	+0.06	0.26	0.19	0.07	NEW
19	14	02H	+0.03	0.73	0.7	0.03	
19	15	02H	+0.03	0.31	0.29	0.02	NEW
19	15	03H	-0.03	0.19	0.3	-0.11	NEW
19	15	04H	-0.06	0.15	0.34	-0.19	NEW
19	17	02H	+0.12	0.98	0.88	0.1	
19	19	02H	-0.03	0.38	0.39	-0.01	
19	23	02H	+0.03	0.37	0.6	-0.23	
19	26	02H	+0.00	0.85	0.9	-0.05	
19	26	04H	+0.00	0.27	0.1	0.17	NEW
19	27	02H	+0.03	0.44	0.3	0.14	NEW
19	27	04H	+0.09	0.16	NDD	N/A	NEW
19	38	02H	+0.03	0.48	0.91	-0.43	
19	41	02H	+0.00	0.39	0.34	0.05	NEW
19	46	02H	+0.00	0.81	0.65	0.16	NEW
19	46	03H	+0.00	0.58	0.45	0.13	NEW
19	46	04H	+0.00	0.74	0.41	0.33	
19	84	02H	+0.09	0.46	0.1	0.36	NEW
19	84	04H	+0.03	0.33	0.24	0.09	NEW
19	85	05H	+0.26	0.45	0.19	0.26	NEW
19	95	02H	+0.09	0.74	0.59	0.15	NEW
20	15	04H	+0.00	0.41	0.5	-0.09	NEW
20	26	04H	-0.03	0.2	0.22	-0.02	
20	31	02H	-0.06	0.48	0.41	0.07	
20	33	02H	+0.06	0.27	0.23	0.04	
20	38	03H	-0.06	0.5	0.56	-0.06	
20	39	03H	+0.06	0.2	0.2	0	NEW
20	40	02H	-0.03	0.33	0.58	-0.25	
20	46	03H	-0.12	0.48	0.33	0.15	
20	47	02H	+0.00	1.31	0.26	1.05	

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
20	47	03H	-0.18	0.3	0.23	0.07	NEW
20	47	04H	-0.06	0.37	0.2	0.17	NEW
20	79	02H	-0.03	0.63	0.76	-0.13	
20	81	02H	+0.03	0.54	0.68	-0.14	
20	88	02H	-0.09	0.23	0.19	0.04	NEW
20	88	04H	+0.03	0.26	0.11	0.15	NEW
20	94	02H	-0.03	0.15	0.14	0.01	NEW
20	97	02H	+0.09	0.17	0.67	-0.5	
20	98	02H	+0.03	0.41	0.48	-0.07	
20	99	02H	+0.06	0.21	0.24	-0.03	
20	106	02H	+0.03	0.65	0.52	0.13	NEW
20	106	05H	+0.06	0.36	0.34	0.02	NEW
21	14	02H	+0.03	0.79	0.94	-0.15	
21	14	04H	+0.03	0.8	0.79	0.01	NEW
21	28	02H	+0.00	0.46	0.4	0.06	NEW
21	33	02H	+0.06	0.84	0.8	0.04	
21	39	02H	+0.09	0.19	0.55	-0.36	
21	41	02H	+0.17	0.2	0.18	0.02	NEW
21	41	03H	+0.03	0.64	0.55	0.09	NEW
21	44	02H	-0.03	0.19	0.17	0.02	NEW
21	48	02H	+0.00	0.9	0.65	0.25	NEW
21	75	04H	+0.03	0.46	0.51	-0.05	
21	76	02H	-0.03	0.34	0.36	-0.02	PLUGGED
21	76	03H	+0.06	0.22	0.43	-0.21	PLUGGED
21	77	02H	+0.00	0.48	0.26	0.22	NEW
21	77	04H	+0.06	0.34	0.3	0.04	NEW
21	88	04H	+0.09	0.17	0.17	0	NEW
21	95	02H	+0.06	0.33	0.31	0.02	
22	15	02H	+0.00	0.62	0.4	0.22	NEW
22	16	02H	-0.03	0.36	0.29	0.07	NEW
22	21	03H	+0.06	0.37	0.35	0.02	NEW
22	37	02H	+0.23	0.39	0.44	-0.05	
22	37	03H	+0.12	0.42	0.38	0.04	
22	78	02H	+0.03	0.81	0.6	0.21	
22	79	02H	+0.03	0.31	0.54	-0.23	
22	89	04H	+0.06	0.23	0.16	0.07	NEW
22	113	02H	+0.12	0.14	0.11	0.03	NEW
23	20	02H	+0.03	0.48	0.5	-0.02	
23	47	03H	-0.12	0.27	0.5	-0.23	
23	54	03H	+0.12	0.27	0.26	0.01	NEW
23	58	04H	+0.00	0.18	0.29	-0.11	NEW
23	66	02H	-0.06	0.72	0.87	-0.15	NEW
23	66	04H	+0.03	0.62	0.82	-0.2	
23	71	04H	-0.09	0.27	0.32	-0.05	NEW
23	73	03H	+0.06	0.23	0.29	-0.06	NEW
23	77	04H	+0.03	0.24	0.45	-0.21	
23	81	02H	+0.00	0.28	0.25	0.03	NEW
23	91	02H	+0.03	0.42	0.38	0.04	NEW
23	95	04H	+0.00	0.21	0.17	0.04	NEW
23	102	02H	-0.03	0.22	0.24	-0.02	

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
24	34	02H	+0.09	0.89	1.11	-0.22	
24	58	02H	+0.09	0.21	0.25	-0.04	NEW
24	64	02H	+0.06	0.42	0.3	0.12	
24	64	03H	+0.00	0.46	0.45	0.01	
24	66	04H	+0.15	0.34	0.46	-0.12	
24	78	02H	+0.00	0.37	0.53	-0.16	
24	78	03H	+0.06	0.28	0.23	0.05	
24	79	02H	-0.06	0.31	0.3	0.01	NEW
24	80	02H	+0.03	0.96	0.9	0.06	
24	83	02H	+0.03	0.19	0.45	-0.26	
24	85	02H	+0.03	0.24	0.54	-0.3	
24	85	04H	+0.00	0.22	0.6	-0.38	
24	93	02H	+0.06	0.48	0.37	0.11	NEW
24	103	02H	+0.00	0.54	0.57	-0.03	
24	103	04H	+0.03	0.26	0.23	0.03	NEW
24	104	04H	+0.03	0.28	0.25	0.03	NEW
24	105	03H	+0.03	0.34	0.28	0.06	NEW
25	19	03H	+0.00	0.14	0.09	0.05	NEW
25	22	02H	+0.03	0.56	0.57	-0.01	NEW
25	39	03H	+0.18	0.39	0.73	-0.34	
25	43	02H	-0.03	0.64	0.4	0.24	NEW
25	48	02H	-0.20	0.75	0.5	0.25	NEW
25	55	02H	+0.00	0.28	0.44	-0.16	
25	57	03H	+0.03	0.2	0.36	-0.16	NEW
25	58	03H	+0.03	0.35	0.43	-0.08	NEW
25	64	02H	+0.00	0.16	0.43	-0.27	NEW
25	64	03H	-0.06	0.2	0.35	-0.15	NEW
25	66	04H	+0.03	0.15	0.24	-0.09	NEW
25	67	02H	-0.15	0.68	0.59	0.09	NEW/PLUGGED
25	72	04H	+0.03	0.16	0.19	-0.03	NEW
25	73	02H	+0.06	0.24	0.24	0	NEW/PLUGGED
25	85	02H	+0.00	0.18	0.17	0.01	NEW
25	104	04H	+0.03	0.36	0.31	0.05	NEW
26	14	02H	+0.03	0.35	0.66	-0.31	NEW
26	29	05H	+0.09	0.5	0.25	0.25	NEW
26	62	02H	+0.09	0.19	0.32	-0.13	NEW
26	64	02H	+0.00	0.39	0.8	-0.41	
26	64	05H	+0.00	0.32	0.45	-0.13	
26	65	02H	+0.03	0.62	0.5	0.12	
26	66	04H	+0.03	0.24	0.46	-0.22	
26	67	02H	+0.00	0.79	0.87	-0.08	
26	67	03H	+0.06	0.51	0.54	-0.03	
26	67	04H	+0.12	0.28	0.64	-0.36	
26	75	03H	+0.15	0.35	0.23	0.12	NEW
26	78	02H	+0.03	0.15	0.13	0.02	NEW
26	79	02H	-0.09	0.32	0.29	0.03	NEW
26	81	02H	-0.03	0.3	0.34	-0.04	
26	82	05H	+0.06	0.13	0.09	0.04	NEW
27	17	02H	+0.06	0.23	0.23	0	
27	34	02H	-0.03	0.43	0.6	-0.17	

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
27	57	02H	+0.06	0.27	0.2	0.07	NEW
27	57	03H	+0.09	0.6	0.5	0.1	NEW
27	65	02H	-0.03	0.14	0.25	-0.11	NEW
27	81	02H	+0.12	0.23	0.49	-0.26	
27	85	02H	+0.03	0.34	0.34	0	NEW
27	86	07H	+0.15	0.25	0.14	0.11	NEW
27	95	02H	+0.03	0.22	0.21	0.01	
27	104	04H	+0.03	0.89	0.76	0.13	
27	107	04H	+0.09	0.18	0.11	0.07	NEW
28	39	03H	-0.03	0.42	0.39	0.03	NEW
28	58	05H	+0.12	0.25	0.33	-0.08	NEW
28	62	02H	+0.09	0.31	0.32	-0.01	NEW
28	62	04H	-0.03	0.39	0.36	0.03	NEW
28	63	02H	+0.06	0.39	0.41	-0.02	NEW
28	66	02H	+0.06	0.28	0.29	-0.01	
28	67	02H	-0.09	0.3	0.42	-0.12	
28	68	02H	+0.03	0.18	0.2	-0.02	
28	78	03H	+0.03	0.13	0.1	0.03	NEW
28	91	02H	-0.06	0.22	0.28	-0.06	
28	92	06H	+0.09	0.21	0.17	0.04	NEW
28	94	04H	-0.06	0.33	0.15	0.18	NEW
29	15	04H	+0.03	0.2	0.13	0.07	NEW
29	24	02H	-0.06	0.5	0.47	0.03	NEW
29	30	04H	+0.03	0.21	0.38	-0.17	
29	35	02H	+0.00	0.13	0.1	0.03	NEW
29	35	04H	+0.03	0.39	0.25	0.14	NEW
29	56	02H	+0.12	0.34	0.45	-0.11	NEW
29	59	02H	+0.09	0.24	0.24	0	NEW
29	63	03H	+0.06	0.36	0.37	-0.01	
29	64	03H	-0.03	0.33	0.26	0.07	NEW
29	74	02H	+0.09	0.12	0.25	-0.13	
29	76	02H	+0.00	0.5	0.62	-0.12	
29	77	02H	+0.09	0.49	0.64	-0.15	
29	81	02H	-0.03	0.18	0.15	0.03	NEW
29	83	02H	-0.03	0.21	0.4	-0.19	
29	83	05H	+0.09	0.4	0.39	0.01	
29	83	06H	+0.12	0.37	0.3	0.07	NEW
29	84	02H	+0.12	0.35	0.44	-0.09	
29	86	02H	+0.09	0.19	0.18	0.01	NEW
29	87	02H	-0.03	0.18	0.13	0.05	NEW
30	26	04H	-0.06	0.47	0.36	0.11	NEW
30	34	02H	+0.00	0.12	0.24	-0.12	
30	47	02H	-0.09	0.27	0.19	0.08	
30	52	02H	-0.03	0.4	0.45	-0.05	
30	52	03H	-0.06	0.62	0.22	0.4	NEW
30	57	02H	+0.09	0.48	0.39	0.09	
30	57	04H	+0.06	0.4	0.41	-0.01	
30	63	04H	+0.06	0.12	0.11	0.01	NEW
30	63	05H	+0.03	0.19	0.23	-0.04	NEW
30	64	02H	+0.03	0.2	0.39	-0.19	

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
30	65	02H	-0.09	0.27	0.45	-0.18	
30	66	02H	+0.06	0.4	0.4	0	
30	69	02H	+0.03	0.38	0.34	0.04	
30	70	02H	+0.03	0.2	0.15	0.05	NEW
30	79	02H	+0.03	0.38	0.31	0.07	NEW
30	84	02H	+0.20	0.67	0.35	0.32	
30	89	03H	+0.03	0.29	0.29	0	NEW
30	91	02H	+0.03	0.3	0.3	0	
30	94	02H	+0.09	0.17	0.18	-0.01	NEW
31	27	03H	+0.03	0.64	0.4	0.24	NEW
31	58	03H	+0.03	0.45	0.4	0.05	NEW
31	62	02H	-0.09	0.16	0.2	-0.04	NEW
31	66	02H	+0.17	0.38	0.36	0.02	NEW
31	67	02H	+0.00	0.6	0.24	0.36	
31	69	04H	+0.06	0.17	0.19	-0.02	NEW
31	83	02H	-0.03	0.17	0.55	-0.38	
31	83	08H	+0.00	0.18	0.17	0.01	NEW
31	84	02H	+0.06	0.45	0.33	0.12	NEW
31	84	03H	+0.09	0.63	0.6	0.03	NEW
31	84	05H	+0.12	0.4	0.31	0.09	NEW
31	91	04H	+0.06	0.25	0.21	0.04	NEW
31	100	03H	+0.09	0.27	0.13	0.14	NEW
31	102	02H	+0.03	0.15	0.08	0.07	NEW
32	20	02H	+0.09	0.31	0.31	0	NEW
32	33	02H	+0.09	0.2	0.18	0.02	
32	33	05H	+0.09	0.47	0.45	0.02	
32	34	04H	+0.09	0.29	0.15	0.14	NEW
32	64	02H	+0.03	0.64	0.93	-0.29	
32	65	02H	+0.00	0.22	0.21	0.01	
32	65	04H	+0.12	0.31	0.13	0.18	
32	67	02H	+0.12	0.19	0.1	0.09	NEW
32	75	04H	+0.00	0.41	0.38	0.03	
32	80	03H	+0.00	0.21	0.15	0.06	NEW
32	81	02H	-0.06	0.19	0.29	-0.1	
32	97	02H	+0.03	0.18	0.14	0.04	NEW
33	19	04H	+0.06	0.39	0.43	-0.04	NEW
33	28	02H	+0.12	0.14	0.3	-0.16	
33	28	04H	+0.18	0.15	0.1	0.05	NEW
33	68	02H	+0.03	0.48	0.34	0.14	NEW
33	76	04H	+0.06	0.59	0.48	0.11	NEW
33	78	04H	+0.00	0.21	0.18	0.03	NEW
33	85	07H	+0.00	0.11	0.15	-0.04	
34	29	04H	+0.26	0.24	0.22	0.02	
34	41	02H	+0.00	0.89	0.86	0.03	
34	42	03H	+0.09	0.26	0.18	0.08	NEW
34	71	03H	-0.09	0.31	0.3	0.01	NEW
34	75	02H	+0.12	0.41	0.35	0.06	NEW
34	76	02H	+0.03	0.37	0.35	0.02	NEW
34	76	04H	+0.03	0.22	0.2	0.02	NEW
34	80	02H	+0.03	0.54	0.42	0.12	

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
34	80	04H	+0.03	0.28	0.34	-0.06	
34	81	02H	+0.12	0.5	0.4	0.1	NEW
34	81	03H	+0.06	0.33	0.28	0.05	NEW
34	101	04H	+0.00	0.27	0.16	0.11	NEW
34	102	03H	+0.03	0.23	0.17	0.06	NEW
35	21	03H	+0.06	0.37	0.31	0.06	NEW
35	26	04H	+0.09	0.3	0.24	0.06	NEW
35	31	02H	+0.12	0.24	BDA	N/A	NEW
35	35	04H	+0.09	0.19	0.14	0.05	
35	36	03H	+0.12	0.71	0.65	0.06	
35	36	04H	+0.09	0.3	0.38	-0.08	
35	39	02H	+0.00	0.38	0.38	0	
35	40	04H	+0.00	0.3	0.25	0.05	NEW
35	48	02H	+0.00	0.47	0.35	0.12	NEW
35	56	02H	+0.06	0.29	0.27	0.02	NEW
35	56	05H	+0.03	0.47	0.27	0.2	NEW
35	57	03H	+0.06	0.26	0.25	0.01	NEW
35	58	02H	+0.09	0.14	0.39	-0.25	
35	64	02H	+0.09	0.32	0.34	-0.02	
35	75	02H	+0.09	0.17	0.15	0.02	NEW
35	77	02H	+0.00	0.23	0.2	0.03	NEW
35	77	07H	+0.12	0.28	0.2	0.08	NEW
35	83	02H	+0.00	0.38	0.27	0.11	NEW
35	85	04H	+0.09	0.19	0.42	-0.23	
35	86	02H	+0.12	0.2	0.17	0.03	NEW
35	87	04H	+0.03	0.17	0.13	0.04	NEW
35	90	02H	+0.09	0.48	0.45	0.03	NEW
35	93	03H	+0.00	0.17	0.57	-0.4	
35	101	02H	+0.03	0.64	0.43	0.21	NEW
36	24	04H	+0.03	0.25	0.27	-0.02	NEW
36	25	02H	+0.03	0.34	0.3	0.04	NEW
36	30	02H	-0.03	0.11	0.18	-0.07	
36	34	06H	-0.06	0.17	0.2	-0.03	NEW
36	47	04H	-0.12	0.33	0.2	0.13	NEW
36	74	03H	+0.00	0.59	0.58	0.01	NEW
36	87	04H	+0.00	0.46	0.35	0.11	NEW
36	95	03H	+0.06	0.47	0.23	0.24	NEW
36	100	04H	+0.12	0.15	0.06	0.09	NEW
37	28	02H	+0.20	0.41	0.11	0.3	NEW
37	33	02H	-0.06	0.24	0.24	0	NEW
37	39	03H	+0.00	0.73	0.78	-0.05	
37	57	04H	+0.00	0.24	0.4	-0.16	
37	75	04H	+0.03	0.33	0.3	0.03	NEW
37	76	07H	+0.03	0.24	0.2	0.04	NEW
37	80	02H	+0.00	0.36	0.22	0.14	NEW
37	81	02H	-0.12	0.58	0.55	0.03	
37	85	04H	+0.09	0.16	0.32	-0.16	
38	25	04H	+0.00	0.32	0.43	-0.11	NEW
38	28	05H	+0.06	0.48	0.3	0.18	NEW
38	46	02H	+0.00	0.31	0.19	0.12	NEW

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
38	46	04H	+0.06	0.19	0.1	0.09	NEW
38	49	02H	-0.03	1.56	1.51	0.05	
38	49	04H	-0.11	0.34	0.56	-0.22	
38	68	04H	+0.06	0.21	0.34	-0.13	
38	77	02H	+0.00	0.54	0.34	0.2	
38	83	02H	+0.03	0.71	0.5	0.21	
38	83	04H	+0.09	0.26	0.49	-0.23	
38	87	05H	+0.12	0.15	0.14	0.01	NEW
38	88	02H	+0.12	0.48	0.33	0.15	NEW
38	88	03H	+0.06	0.34	0.22	0.12	NEW
38	88	04H	+0.06	0.26	0.24	0.02	NEW
38	94	02H	+0.00	0.26	0.1	0.16	NEW
39	28	02H	+0.06	0.5	0.52	-0.02	
39	31	04H	+0.00	0.58	0.36	0.22	NEW
39	44	04H	+0.03	0.26	0.2	0.06	NEW
39	48	04H	+0.03	0.23	0.19	0.04	NEW
39	50	02H	+0.00	0.13	0.13	0	NEW
39	50	03H	+0.00	0.52	0.26	0.26	
39	68	04H	+0.09	0.19	0.24	-0.05	NEW
39	76	04H	+0.03	0.33	0.44	-0.11	
39	77	02H	+0.00	0.5	0.41	0.09	
39	82	02H	+0.06	0.32	0.32	0	NEW
39	82	03H	+0.09	0.2	0.15	0.05	NEW
39	83	03H	+0.03	0.17	0.13	0.04	NEW
39	86	04H	+0.09	0.31	0.22	0.09	NEW
40	28	04H	+0.15	0.38	0.22	0.16	
40	31	04H	+0.00	0.28	0.15	0.13	NEW
40	35	04H	+0.09	0.29	0.28	0.01	NEW
40	46	02H	-0.09	0.66	0.66	0	NEW
40	48	04H	-0.23	0.22	0.17	0.05	
40	55	02H	+0.06	0.38	0.4	-0.02	NEW
40	64	04H	+0.03	0.23	0.32	-0.09	
40	67	02H	+0.06	0.39	0.8	-0.41	
40	71	02H	-0.06	0.18	0.19	-0.01	NEW
40	77	02H	+0.06	0.51	0.4	0.11	NEW
40	86	04H	+0.03	0.52	0.4	0.12	NEW
40	87	03H	+0.12	0.55	0.56	-0.01	
40	87	04H	+0.03	0.48	0.35	0.13	
40	89	02H	-0.03	0.26	0.26	0	NEW
41	48	04H	-0.06	0.46	0.28	0.18	
41	49	02H	-0.06	0.33	0.29	0.04	NEW
41	50	04H	-0.09	0.14	INR	N/A	NEW
41	68	04H	+0.03	0.37	0.36	0.01	NEW
41	71	02H	+0.00	0.18	0.26	-0.08	NEW
41	75	03H	-0.06	0.17	0.17	0	NEW
41	79	02H	+0.00	0.33	0.3	0.03	NEW
41	80	02H	-0.03	0.17	0.15	0.02	NEW
41	84	02H	+0.20	0.52	0.38	0.14	NEW
41	84	09H	+0.06	0.21	0.18	0.03	NEW
42	44	02H	+0.00	0.15	0.1	0.05	NEW

TABLE 3-6 (Cont'd)
S/G C DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
42	45	02H	+0.09	0.72	0.71	0.01	NEW
42	45	04H	+0.00	0.41	0.4	0.01	NEW
42	48	04H	-0.09	0.37	0.33	0.04	
42	50	04H	-0.12	0.3	0.2	0.1	NEW
42	71	02H	-0.03	0.35	0.58	-0.23	
42	71	04H	+0.00	0.35	0.36	-0.01	NEW
42	75	04H	+0.03	0.42	0.47	-0.05	
42	76	02H	+0.00	0.31	0.37	-0.06	
42	76	04H	+0.03	0.46	0.4	0.06	NEW
42	81	02H	+0.06	0.75	0.65	0.1	
42	88	04H	+0.09	0.22	0.22	0	NEW
42	90	03H	+0.09	0.16	0.11	0.05	NEW
42	91	04H	+0.03	0.19	0.11	0.08	NEW
43	64	04H	+0.06	0.19	0.46	-0.27	
43	68	04H	+0.03	0.22	0.23	-0.01	NEW
43	69	05H	+0.06	0.25	0.26	-0.01	NEW
43	74	02H	+0.03	0.67	0.68	-0.01	
43	76	04H	+0.03	0.33	0.28	0.05	
43	77	02H	+0.06	0.24	0.42	-0.18	
43	77	04H	-0.03	0.22	0.15	0.07	NEW
43	79	02H	+0.00	0.26	0.22	0.04	NEW
43	79	03H	+0.03	0.2	0.15	0.05	NEW
43	81	04H	-0.03	0.17	0.15	0.02	NEW
43	87	04H	+0.00	0.25	0.16	0.09	NEW
44	42	02H	-0.03	0.65	0.63	0.02	
44	43	02H	-0.12	0.34	0.29	0.05	NEW
44	55	04H	+0.03	0.45	0.4	0.05	NEW
44	55	05H	+0.06	0.16	0.18	-0.02	NEW
44	57	06H	+0.00	0.16	0.25	-0.09	NEW
44	72	02H	+0.09	0.14	0.13	0.01	
44	75	02H	+0.06	0.54	0.4	0.14	NEW
44	85	04H	-0.03	0.19	0.18	0.01	NEW
45	49	02H	-0.06	0.21	0.16	0.05	NEW
45	74	02H	+0.09	0.42	0.2	0.22	
45	76	04H	+0.00	0.3	0.25	0.05	NEW
45	77	04H	+0.00	0.25	0.22	0.03	NEW
45	84	02H	+0.06	0.35	0.13	0.22	NEW
46	41	04H	+0.09	0.22	0.2	0.02	NEW
46	50	02H	-0.06	0.43	0.5	-0.07	
46	50	04H	-0.03	0.23	0.1	0.13	NEW
46	72	02H	+0.09	0.18	0.2	-0.02	
47	71	02H	+0.09	0.13	0.1	0.03	NEW

TABLE 3-7
S/G D DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
8	11	02H	+0.06	0.66	0.22	0.44	NEW
9	7	02H	+0.03	0.35	0.2	0.15	NEW
9	11	02H	+0.06	0.46	0.33	0.13	NEW
9	13	05H	+0.06	0.17	0.2	-0.03	NEW
10	7	02H	+0.03	0.54	0.16	0.38	
10	10	02H	+0.06	0.5	0.24	0.26	
10	13	05H	+0.03	0.27	0.07	0.2	NEW
10	15	02H	+0.03	0.3	0.16	0.14	NEW
10	15	04H	+0.09	0.15	0.08	0.07	NEW
10	16	02H	-0.03	0.38	0.47	-0.09	
10	17	02H	+0.06	0.21	0.33	-0.12	
11	10	05H	+0.06	0.29	0.12	0.17	NEW
11	11	03H	+0.06	0.33	0.16	0.17	NEW
11	13	02H	+0.03	0.31	0.34	-0.03	NEW
11	13	05H	+0.06	0.32	0.16	0.16	NEW
11	15	02H	+0.15	0.37	0.15	0.22	NEW
12	7	02H	+0.00	0.28	0.14	0.14	NEW
12	11	05H	-0.03	0.21	0.11	0.1	NEW
12	15	02H	+0.00	0.47	0.35	0.12	
12	16	04H	+0.09	0.27	0.18	0.09	NEW
13	11	02H	+0.00	0.5	0.45	0.05	NEW
13	12	02H	+0.00	0.18	0.12	0.06	
13	102	05H	+0.03	0.34	0.32	0.02	NEW
13	108	02H	-0.03	0.31	0.39	-0.08	NEW
14	16	02H	+0.21	0.22	0.3	-0.08	NEW
14	16	04H	+0.12	0.66	0.29	0.37	
14	17	02H	+0.03	0.54	0.4	0.14	
14	17	04H	+0.00	0.21	0.25	-0.04	
14	17	07H	+0.00	0.28	0.18	0.1	NEW
14	23	05H	+0.00	0.33	0.22	0.11	NEW
14	97	04H	+0.12	0.24	0.2	0.04	NEW
15	9	02H	+0.00	0.32	0.32	0	
15	10	02H	+0.12	0.48	0.49	-0.01	
15	10	05H	+0.12	0.3	0.17	0.13	NEW
15	12	02H	+0.06	0.35	0.33	0.02	
15	12	05H	-0.06	0.39	0.3	0.09	
15	13	04H	+0.06	0.3	0.29	0.01	
15	17	02H	+0.00	0.62	0.36	0.26	NEW
15	18	02H	+0.06	0.41	0.34	0.07	
15	26	02H	-0.06	0.36	0.4	-0.04	NEW
16	15	03H	+0.09	0.34	0.13	0.21	NEW
16	28	02H	+0.12	0.38	0.41	-0.03	NEW
16	29	02H	+0.00	0.26	0.25	0.01	NEW
16	74	02H	+0.00	0.35	0.21	0.14	NEW
16	102	05H	+0.12	0.18	0.3	-0.12	NEW
17	12	02H	+0.06	0.69	0.51	0.18	
17	28	02H	+0.09	0.22	0.21	0.01	NEW
17	30	02H	+0.00	0.54	0.27	0.27	NEW
17	32	02H	+0.03	0.29	0.37	-0.08	
17	103	02H	-0.03	0.63	0.6	0.03	

TABLE 3-7 (Cont'd)
S/G D DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
17	104	02H	+0.00	0.19	0.48	-0.29	
17	104	03H	-0.03	0.52	0.51	0.01	
17	108	04H	+0.06	0.15	0.13	0.02	NEW
18	12	02H	-0.03	0.4	0.19	0.21	
18	14	02H	+0.00	0.26	0.1	0.16	NEW
18	90	05H	+0.00	0.28	0.32	-0.04	NEW
18	93	02H	+0.09	0.21	0.21	0	NEW
18	95	02H	+0.03	0.77	0.89	-0.12	
18	98	02H	-0.06	0.2	0.67	-0.47	
18	101	02H	+0.00	0.13	0.28	-0.15	NEW
18	102	02H	+0.09	0.47	0.52	-0.05	
18	109	02H	+0.06	0.58	0.58	0	NEW
18	109	05H	+0.06	0.25	0.19	0.06	NEW
18	110	02H	+0.12	0.36	0.33	0.03	NEW
19	13	02H	+0.09	0.19	0.2	-0.01	NEW
19	13	04H	+0.00	0.55	0.47	0.08	NEW
19	16	02H	+0.06	0.33	0.31	0.02	
19	20	02H	+0.00	0.29	0.16	0.13	NEW
19	20	04H	+0.00	0.38	0.27	0.11	NEW
19	22	02H	+0.13	0.46	0.35	0.11	NEW
19	34	02H	+0.00	0.25	0.24	0.01	
19	39	02H	+0.12	0.57	0.31	0.26	NEW
19	73	02H	+0.09	0.2	0.19	0.01	NEW
19	83	04H	+0.00	0.4	0.36	0.04	
19	90	02H	-0.03	0.43	0.48	-0.05	
19	93	02H	+0.00	0.31	0.41	-0.1	
19	94	02H	+0.03	0.26	0.4	-0.14	
19	95	02H	+0.00	0.2	0.32	-0.12	
19	101	03H	+0.03	0.32	0.49	-0.17	NEW
19	102	02H	-0.09	0.52	0.3	0.22	
20	19	02H	+0.00	0.36	0.31	0.05	NEW
20	42	02H	+0.06	0.53	0.32	0.21	NEW
20	74	02H	+0.12	0.22	0.17	0.05	NEW
20	88	04H	+0.00	0.29	0.13	0.16	NEW
20	104	04H	+0.06	0.17	0.19	-0.02	NEW
21	17	04H	-0.03	0.36	0.21	0.15	NEW
21	32	02H	-0.06	0.41	0.22	0.19	
21	90	03H	+0.03	0.22	0.22	0	
21	93	02H	+0.06	0.83	0.96	-0.13	
21	93	04H	+0.12	0.35	0.31	0.04	NEW
21	97	02H	+0.03	0.29	0.45	-0.16	
21	99	02H	+0.03	0.27	0.24	0.03	NEW
22	11	02H	+0.03	0.36	0.24	0.12	NEW
22	13	04H	+0.03	0.23	0.1	0.13	NEW
22	14	02H	+0.00	0.62	0.04	0.58	NEW
22	28	04H	-0.09	0.35	0.26	0.09	NEW
22	31	02H	+0.00	0.27	0.23	0.04	NEW
22	36	02H	+0.03	0.21	0.48	-0.27	
22	42	03H	+0.06	0.59	0.4	0.19	NEW
22	74	02H	+0.03	0.48	0.54	-0.06	

TABLE 3-7 (Cont'd)
S/G D DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
22	74	04H	-0.03	0.46	0.29	0.17	NEW
22	80	02H	+0.03	0.33	0.19	0.14	
22	95	02H	+0.09	0.24	0.27	-0.03	NEW
22	96	02H	+0.09	0.11	0.52	-0.41	
22	98	03H	+0.06	0.1	0.29	-0.19	
22	104	09H	+0.03	0.3	0.27	0.03	NEW
23	15	07H	+0.09	0.19	0.11	0.08	NEW
23	17	02H	+0.00	0.43	0.36	0.07	NEW
23	28	02H	+0.00	0.38	0.21	0.17	
23	31	02H	+0.15	0.49	0.31	0.18	
23	41	02H	+0.03	0.15	0.2	-0.05	NEW
23	41	05H	-0.03	0.1	0.11	-0.01	NEW
23	42	03H	+0.00	0.33	0.1	0.23	NEW
23	75	04H	-0.09	0.2	0.37	-0.17	
23	87	03H	+0.09	0.34	0.23	0.11	NEW
23	97	03H	+0.12	0.3	0.22	0.08	NEW
24	14	02H	+0.03	0.75	0.43	0.32	NEW
24	14	04H	+0.06	0.42	0.23	0.19	NEW
24	14	08H	+0.15	0.22	0.14	0.08	NEW
24	15	02H	+0.03	0.54	0.51	0.03	
24	16	02H	+0.06	0.3	0.3	0	NEW
24	17	04H	+0.09	0.36	0.26	0.1	NEW
24	18	02H	+0.03	0.5	0.5	0	
24	18	03H	+0.03	0.31	0.19	0.12	NEW
24	18	04H	+0.09	0.54	0.17	0.37	NEW
24	18	06H	+0.00	0.36	0.36	0	NEW
24	18	07H	+0.09	0.51	0.35	0.16	NEW
24	19	02H	+0.06	0.29	0.2	0.09	NEW
24	38	02H	-0.03	0.53	0.18	0.35	
24	40	02H	+0.00	0.33	0.19	0.14	NEW
24	41	02H	-0.06	0.32	0.19	0.13	NEW
24	87	03H	+0.00	0.59	0.27	0.32	NEW
24	98	02H	+0.00	0.29	0.37	-0.08	
24	106	05H	+0.15	0.39	0.36	0.03	NEW
25	15	02H	+0.00	0.46	0.29	0.17	NEW
25	15	05H	+0.06	0.34	0.26	0.08	NEW
25	16	02H	+0.03	0.45	0.45	0	
25	18	02H	+0.03	0.42	0.21	0.21	NEW
25	23	02H	-0.03	0.24	0.3	-0.06	NEW
25	40	02H	-0.06	0.21	0.15	0.06	NEW
25	42	02H	-0.12	0.38	0.22	0.16	NEW
25	43	02H	+0.09	0.17	0.14	0.03	NEW
25	62	02H	+0.06	0.7	0.25	0.45	NEW
25	64	02H	+0.03	0.31	1.22	-0.91	
25	67	03H	+0.03	0.31	0.33	-0.02	
25	73	02H	+0.03	0.82	0.74	0.08	PLUGGED
25	73	03H	+0.00	0.81	0.42	0.39	PLUGGED
25	73	06H	+0.09	0.17	0.12	0.05	NEW/PLUGGED
25	75	02H	-0.03	0.7	0.71	-0.01	
25	88	02H	+0.03	1.43	0.76	0.67	

TABLE 3-7 (Cont'd)
S/G D DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
25	90	02H	+0.00	0.55	0.45	0.1	
25	94	03H	-0.06	0.53	0.51	0.02	NEW
25	100	06H	-0.09	0.25	0.21	0.04	NEW
25	107	02H	+0.03	0.41	0.58	-0.17	NEW
25	107	04H	+0.03	0.22	0.41	-0.19	NEW
25	108	02H	+0.03	0.39	0.35	0.04	NEW
26	35	02H	+0.09	0.46	0.68	-0.22	
26	41	02H	+0.06	0.37	0.21	0.16	NEW
26	56	02H	-0.03	0.24	0.31	-0.07	NEW
26	62	02H	+0.06	0.29	0.32	-0.03	NEW
26	64	02H	+0.03	0.62	0.64	-0.02	
26	64	03H	+0.06	0.69	0.34	0.35	NEW
26	64	04H	+0.03	0.66	0.47	0.19	
26	68	02H	+0.06	0.29	0.36	-0.07	
26	72	02H	+0.12	0.41	0.27	0.14	NEW
26	84	02H	+0.00	0.52	0.55	-0.03	
26	93	03H	-0.03	0.29	0.35	-0.06	NEW
26	97	02H	+0.03	0.58	0.77	-0.19	
26	108	02H	+0.12	0.41	0.39	0.02	NEW
27	16	02H	+0.09	0.17	0.24	-0.07	NEW
27	31	02H	-0.12	0.42	0.2	0.22	NEW
27	36	02H	+0.03	0.34	0.23	0.11	NEW
27	52	03H	-0.06	0.53	0.38	0.15	NEW
27	54	02H	-0.03	0.26	0.22	0.04	NEW
27	64	02H	+0.06	0.48	0.35	0.13	
27	68	02H	+0.12	0.34	0.3	0.04	NEW
27	68	03H	+0.06	0.43	0.37	0.06	NEW
27	73	02H	+0.00	1.47	0.82	0.65	
27	76	07H	-0.06	0.37	0.12	0.25	NEW
27	78	02H	-0.09	0.51	0.17	0.34	NEW
27	100	04H	+0.09	0.26	0.11	0.15	NEW
27	104	03H	-0.09	0.46	0.42	0.04	NEW
27	105	04H	+0.03	0.5	0.62	-0.12	
28	16	02H	+0.12	0.31	0.15	0.16	NEW
28	20	02H	+0.00	0.18	0.09	0.09	NEW
28	66	02H	+0.06	0.63	0.7	-0.07	
28	74	02H	+0.00	0.32	0.45	-0.13	
28	75	02H	-0.06	0.43	0.34	0.09	NEW
28	88	02H	+0.03	0.49	0.26	0.23	NEW
28	88	03H	-0.03	0.59	0.36	0.23	NEW
28	92	03H	+0.09	0.31	0.31	0	NEW
29	20	02H	+0.00	0.2	0.22	-0.02	NEW
29	32	02H	-0.09	0.6	0.34	0.26	
29	39	02H	+0.03	0.33	0.14	0.19	NEW
29	41	03H	+0.03	0.3	0.22	0.08	NEW
29	43	02H	+0.09	0.29	0.26	0.03	
29	69	07H	+0.00	0.36	0.21	0.15	NEW
29	70	02H	-0.03	0.33	0.19	0.14	NEW
29	72	02H	-0.06	0.34	0.32	0.02	
29	78	02H	-0.09	0.34	0.34	0	NEW

TABLE 3-7 (Cont'd)
S/G D DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
29	78	03H	+0.00	0.41	0.14	0.27	NEW
29	99	03H	+0.06	0.25	0.36	-0.11	
29	107	04H	+0.06	0.26	0.36	-0.1	
29	111	02H	+0.06	0.32	0.26	0.06	
30	10	02H	+0.00	0.23	0.38	-0.15	NEW
30	19	03H	+0.00	0.39	0.17	0.22	NEW
30	45	02H	-0.06	0.27	0.11	0.16	NEW
30	48	04H	-0.03	0.58	0.31	0.27	NEW
30	53	02H	-0.15	0.31	0.17	0.14	NEW
30	56	02H	+0.00	0.37	0.15	0.22	NEW
30	67	02H	+0.00	0.43	0.34	0.09	NEW
30	72	02H	-0.06	0.67	0.26	0.41	NEW
30	72	03H	-0.03	0.64	0.15	0.49	NEW
30	96	02H	+0.06	0.37	0.36	0.01	NEW
30	98	02H	+0.09	0.34	0.45	-0.11	
30	100	02H	+0.06	0.41	0.39	0.02	NEW
30	103	02H	+0.12	0.37	0.24	0.13	
30	103	03H	+0.09	0.43	0.45	-0.02	NEW
31	34	02H	+0.12	0.21	0.21	0	NEW
31	34	03H	+0.00	0.34	0.26	0.08	NEW
31	38	02H	-0.03	0.56	0.23	0.33	NEW
31	54	03H	+0.00	0.73	0.61	0.12	NEW
31	58	02H	+0.03	0.18	0.21	-0.03	NEW
31	65	02H	+0.03	0.3	0.23	0.07	
31	71	02H	+0.06	0.28	0.13	0.15	NEW
31	71	03H	+0.00	0.21	0.21	0	NEW
31	71	06H	-0.03	0.1	0.13	-0.03	NEW
31	71	07H	+0.00	0.14	0.09	0.05	NEW
31	72	03H	+0.00	0.51	0.49	0.02	NEW
31	82	02H	+0.00	0.53	0.72	-0.19	
32	17	02H	+0.06	0.51	0.19	0.32	NEW
32	22	02H	-0.03	0.3	0.17	0.13	NEW
32	40	02H	+0.06	0.53	0.11	0.42	NEW
32	53	03H	-0.09	0.5	0.36	0.14	NEW
32	87	03H	+0.03	0.38	0.21	0.17	
32	96	02H	+0.06	0.27	0.23	0.04	NEW
32	97	02H	+0.06	0.32	0.31	0.01	NEW
33	30	04H	+0.00	0.36	0.37	-0.01	NEW
33	30	07H	-0.03	0.26	0.27	-0.01	NEW
33	34	02H	+0.00	0.34	0.17	0.17	NEW
33	34	04H	+0.16	0.18	0.37	-0.19	
33	34	05H	+0.03	0.24	0.11	0.13	NEW
33	38	02H	+0.06	0.25	0.25	0	NEW
33	94	02H	+0.15	0.5	0.5	0	
34	19	02H	+0.03	0.8	0.62	0.18	
34	52	03H	+0.06	0.33	0.24	0.09	NEW
34	62	02H	+0.06	0.21	0.25	-0.04	NEW
34	67	08H	+0.09	0.17	0.12	0.05	NEW
34	93	03H	+0.12	0.38	0.35	0.03	NEW
35	19	02H	+0.00	0.44	0.14	0.3	NEW

TABLE 3-7 (Cont'd)
S/G D DSI's DETECTED IN 1RE06

ROW	COL	LOCATION		1996 1RE06 VOLTS	1995 1RE05 VOLTS	CHANGE IN VOLTS	COMMENTS
35	19	03H	+0.03	0.5	0.53	-0.03	NEW
35	19	05H	+0.06	0.37	0.11	0.26	NEW
35	23	02H	+0.06	0.2	0.25	-0.05	NEW
35	34	03H	+0.06	0.28	0.12	0.16	NEW
35	44	07H	+0.15	0.21	0.25	-0.04	NEW
35	83	02H	+0.06	0.23	0.14	0.09	
35	88	04H	-0.03	0.37	0.31	0.06	
35	91	04H	+0.03	0.23	0.4	-0.17	
36	39	05H	+0.00	0.39	0.18	0.21	NEW
36	44	02H	+0.09	0.22	0.1	0.12	NEW
36	73	02H	+0.03	0.3	0.31	-0.01	
36	91	03H	+0.03	0.31	0.34	-0.03	NEW
36	99	02H	+0.09	0.53	0.55	-0.02	NEW
37	17	02H	+0.03	0.44	0.45	-0.01	NEW
37	29	02H	-0.03	0.21	0.19	0.02	NEW
37	31	02H	-0.03	0.54	0.14	0.4	NEW
37	32	02H	+0.09	1.58	0.98	0.6	
37	85	03H	+0.09	0.68	0.54	0.14	NEW
37	87	03H	+0.00	0.49	0.45	0.04	
37	90	02H	+0.00	0.87	0.66	0.21	
37	96	02H	+0.09	0.28	0.22	0.06	NEW
37	100	02H	+0.06	0.39	0.31	0.08	NEW
37	100	04H	+0.09	0.27	0.37	-0.1	NEW
38	32	03H	+0.03	0.35	0.32	0.03	NEW
38	37	04H	-0.09	0.34	0.12	0.22	NEW
38	75	02H	-0.03	0.25	0.15	0.1	NEW
39	28	07H	+0.06	0.27	0.07	0.2	NEW
39	55	04H	+0.06	0.29	0.13	0.16	NEW
39	64	05H	-0.12	0.35	0.22	0.13	
39	64	07H	-0.09	0.34	0.15	0.19	
39	72	02H	+0.03	0.2	0.2	0	NEW
39	82	02H	+0.03	0.59	0.73	-0.14	
39	89	02H	-0.03	0.36	0.36	0	NEW
41	94	04H	+0.09	0.27	0.32	-0.05	NEW
44	45	02H	-0.06	0.22	0.14	0.08	NEW

4.0 Bobbin Voltage Distributions

This section provides the voltage distributions used in the leak rate and probability of burst calculations as well as the projected end-of-cycle 7 (EOC7) distributions. These distributions are provided in both tabular and graphical formats at the end of this section of the report. For the voltage distribution graphs, the voltage values shown on the x-axis are the upper limits for that particular bin. For example, a 0.9 volt bin would contain indications ranging from 0.81 to 0.90 volts inclusive.

4.1 EOC6 Voltage Distributions

The voltages for the DSI's detected during the 1RE06 inspection were binned in 0.1 volt increments. The "as-found" voltage distributions used in the determination of the beginning of cycle 7 (BOC7) distributions are shown in Tables 4-1 through 4-5 and Figures 4-1 through 4-5.

4.2 Repaired Indications

The voltage distributions for repaired indications are provided in Tables 4-1 through 4-5 and Figures 4-6 through 4-10. The repaired indications category includes indications in tubes which were repaired for reasons other than ODSCC at the TSP's. A total of 10 DSI's were removed from service during 1RE06. Only one of these indications, however, was removed from service due to ODSCC at the support plate. The other nine indications were removed from service due to other reasons.

4.3 DSI's Left In Service

The voltage distributions for the DSI's which were left in service are shown in Tables 4-1 through 4-5 and Figures 4-11 through 4-16. This distribution includes the DSI's detected during the 1RE06 inspection (Section 4.1) less the repaired indications (Section 4.2)

The Generic Letter also requires that the distribution of the DSI's which were left in service and were also confirmed by RPC to be crack-like or were not inspected with RPC be provided in this report. These distributions are provided in Tables 4-1 through 4-5 and Figures 4-16 through 4-20. Since all of the DSI's greater than 1.0 volt were inspected with RPC, no indications greater than 1.0 volt are included in this distribution.

4.4 BOC7 Voltage Distributions

To determine the BOC7 voltage distributions, the EOC6 as found distributions were adjusted to account for the probability of detection (POD) and the tubes which were removed from service. The POD is a ratio of the indications detected to the total number of indications present. The POD, thus, accounts for those indications which may not have been detected during the bobbin inspection. In accordance with the Generic Letter, a POD of 0.6 was used in the determination of the BOC7 voltage distribution. The number of indications in each of the EOC6 as found voltage bins was divided by the POD of 0.6 to give the total number of indications assumed to be present. This number was then reduced by the number of indications which were removed from service. This relationship is shown as Equation 4-1 below.

$$N_{BOC7} = \frac{N_{EOC6}}{POD} - N_{Repaired} \qquad \text{Eq. 4-1}$$

The number of indications being repaired includes those indications in tubes which are being repaired for other reasons such as top-of-tubesheet degradation. The resulting BOC7 distributions are shown in Tables 4-1 through 4-5 and Figures 4-21 through 4-25.

4.5 Voltage Growth Distributions

As discussed in Section 3.2, an analysis was performed to determine the growth of the DSI's for Cycle 6. In accordance with the Generic Letter, voltage growth rates were only evaluated for those intersections at which bobbin indications could be identified at both the 1RE05 and 1RE06 inspections. The actual growth values were divided by the Cycle 6 operating interval of 1.059 EFPY to obtain growth values in terms of delta volts per EFPY. These corrected growth values were then binned in 0.1 volt increments. For the purposes of the tube integrity calculations, the negative growth values were included as zero growth rates as required by the Generic Letter. These growth distributions are shown in Table 4-6 and Figures 4-26 through 4-30.

Since some of the steam generators had less than 200 indications for use in the growth distribution, a conservative bounding distribution was used for the tube integrity calculations. This bounding distribution was applied to all four generators in lieu of using generator-specific growth distributions. In order to develop a bounding distribution, the growth distributions for each steam generator must be put into a format which will allow comparisons among the steam generators. For this reason, the growth distribution for each steam generator was put into a cumulative percent format. The cumulative percent growth values are shown in Table 4-6. These values correspond to the percentage of indications which have voltages less than or equal to the voltage associated with a particular bin. Therefore, for a particular

voltage bin, the steam generator with the lowest cumulative percent would have the highest percentage of indications showing growth greater than that particular voltage. For each voltage bin, the bounding distribution incorporates the lowest cumulative percent among the four steam generators. The bounding growth distribution is shown in Table 4-6 and Figure 4-31.

4.6 NDE Uncertainty Distributions

NDE uncertainties must be taken into account when projecting the end-of-cycle voltages for the next operating cycle. The NDE uncertainties used in the calculations of the EOC7 voltages are described in Reference 7.1. The acquisition uncertainty was sampled from a normal distribution with a mean of zero, a standard deviation of 7%, and a cutoff limit of 15%. This 15% limit is based on the use of the probe wear standard and the fact that probes are replaced when the voltage measurements on the probe wear standard differ by more than 15% compared to the measurement when the probe was new. The analyst uncertainty was sampled from a normal distribution with a mean of zero, a standard deviation of 10.3%, and no cutoff limit. These uncertainty distributions are provided in Table 4-7 and Figure 4-32.

4.7 Projected EOC7 Voltage Distributions

The EOC7 voltage distributions were obtained by applying a monte carlo sampling process to the BOC7 voltages. This process randomly assigns uncertainty values and a growth value to each of the BOC7 indications. Since the growth distribution derived in Section 4.5 is in terms of delta volts per EFPY, the growth values from this distribution must be corrected for the expected length of Cycle 7. Therefore, the growth values are multiplied by the expected cycle length of 1.353 EFPY. This random sampling process was performed for each BOC7 indication in the steam generator resulting in an EOC7 voltage for each BOC7 indication. Each sampling of all of the BOC7 indications in a steam generator is called a 'trial'. Many trials were performed and the resulting EOC7 voltages were binned in 0.1 volt increments. The resulting bin values were then divided by the number of trials which were performed to obtain the average number of EOC7 indications per trial in each voltage bin. The projected EOC7 voltage distributions shown in Table 4-8 and Figures 4-33 through 4-37 are based on 1×10^6 trials.

Table 4-1
EOC6 And BOC7 Voltage Distributions For S/G A

Voltage Bin	EOC6 As Found	With 0.6 POD Applied	Plugged	BOC7	DSI's Returned To Service	
					Crack-Like or Not Insp w/ RPC	Total
0.0-0.1	3	5.0	0	5.0	3	3
0.11-0.2	23	38.3	0	38.3	23	23
0.21-0.3	29	48.3	0	48.3	29	29
0.31-0.4	44	73.3	0	73.3	43	44
0.41-0.5	26	43.3	0	43.3	26	26
0.51-0.6	24	40.0	0	40.0	24	24
0.61-0.7	13	21.7	0	21.7	13	13
0.71-0.8	2	3.3	0	3.3	2	2
0.81-0.9	4	6.7	0	6.7	4	4
0.91-1.0	3	5.0	0	5.0	3	3
1.01-1.1	0	0.0	0	0.0	0	0
1.11-1.2	0	0.0	0	0.0	0	0
1.21-1.3	0	0.0	0	0.0	0	0
1.31-1.4	0	0.0	0	0.0	0	0
1.41-1.5	0	0.0	0	0.0	0	0
1.51-1.6	0	0.0	0	0.0	0	0
>1.6	0	0.0	0	0.0	0	0
Total	171	285.0	0	285.0	170	171

Table 4-2
EOC6 And BOC7 Voltage Distributions For S/G B

Voltage Bin	EOC6 As Found	With 0.6 POD Applied	Plugged	BOC7	DSI's Returned To Service	
					Crack-Like or Not Insp w/ RPC	Total
0.0-0.1	0	0.0	0	0.0	0	0
0.11-0.2	16	26.7	1	25.7	15	15
0.21-0.3	35	58.3	0	58.3	35	35
0.31-0.4	25	41.7	1	40.7	24	24
0.41-0.5	19	31.7	0	31.7	19	19
0.51-0.6	16	26.7	0	26.7	16	16
0.61-0.7	5	8.3	0	8.3	5	5
0.71-0.8	5	8.3	0	8.3	5	5
0.81-0.9	1	1.7	0	1.7	1	1
0.91-1.0	2	3.3	0	3.3	2	2
1.01-1.1	0	0.0	0	0.0	0	0
1.11-1.2	0	0.0	0	0.0	0	0
1.21-1.3	0	0.0	0	0.0	0	0
1.31-1.4	0	0.0	0	0.0	0	0
1.41-1.5	1	1.7	1	0.7	0	0
1.51-1.6	0	0.0	0	0.0	0	0
>1.6	0	0.0	0	0.0	0	0
Total	125	208.3	3	205.3	122	122

Table 4-3
EOC6 And BOC7 Voltage Distributions For S/G C

Voltage Bin	EOC6 As Found	With 0.6 POD Applied	Plugged	BOC7	DSI's Returned To Service	
					Crack-Like or Not Insp w/ RPC	Total
0.0-0.1	0	0.0	0	0.0	0	0
0.11-0.2	98	163.3	0	163.3	98	98
0.21-0.3	113	188.3	2	186.3	111	111
0.31-0.4	94	156.7	1	155.7	93	93
0.41-0.5	64	106.7	0	106.7	64	64
0.51-0.6	24	40.0	0	40.0	24	24
0.61-0.7	21	35.0	1	34.0	20	20
0.71-0.8	15	25.0	0	25.0	15	15
0.81-0.9	9	15.0	0	15.0	9	9
0.91-1.0	2	3.3	0	3.3	2	2
1.01-1.1	0	0.0	0	0.0	0	0
1.11-1.2	0	0.0	0	0.0	0	0
1.21-1.3	0	0.0	0	0.0	0	0
1.31-1.4	1	1.7	0	1.7	0	1
1.41-1.5	0	0.0	0	0.0	0	0
1.51-1.6	1	1.7	0	1.7	0	1
>1.6	0	0.0	0	0.0	0	0
Total	442	736.7	4	732.7	436	438

Table 4-4
EOC6 And BOC7 Voltage Distributions For S/G D

Voltage Bin	EOC6 As Found	With 0.6 POD Applied	Plugged	BOC7	DSI's Returned To Service	
					Crack-Like or Not Insp w/ RPC	Total
0.0-0.1	3	5.0	0	5.0	3	3
0.11-0.2	27	45.0	1	44.0	26	26
0.21-0.3	78	130.0	0	130.0	78	78
0.31-0.4	79	131.7	0	131.7	79	79
0.41-0.5	40	66.7	0	66.7	40	40
0.51-0.6	32	53.3	0	53.3	32	32
0.61-0.7	15	25.0	0	25.0	15	15
0.71-0.8	4	6.7	0	6.7	4	4
0.81-0.9	4	6.7	2	4.7	2	2
0.91-1.0	0	0.0	0	0.0	0	0
1.01-1.1	0	0.0	0	0.0	0	0
1.11-1.2	0	0.0	0	0.0	0	0
1.21-1.3	0	0.0	0	0.0	0	0
1.31-1.4	0	0.0	0	0.0	0	0
1.41-1.5	2	3.3	0	3.3	0	2
1.51-1.6	1	1.7	0	1.7	0	1
>1.6	0	0.0	0	0.0	0	0
Total	285	475.0	3	472.0	279	282

Table 4-5
EOC6 And BOC7 Voltage Distributions For All S/G's Combined

Voltage Bin	EOC6 As Found	With 0.6 POD Applied	Plugged	BOC7	DSI's Returned To Service	
					Crack-Like or Not Insp w/ RPC	Total
0.0-0.1	6	10.0	0	10.0	6	6
0.11-0.2	164	273.3	2	271.3	162	162
0.21-0.3	255	425.0	2	423.0	253	253
0.31-0.4	242	403.3	2	401.3	239	240
0.41-0.5	149	248.3	0	248.3	149	149
0.51-0.6	96	160.0	0	160.0	96	96
0.61-0.7	54	90.0	1	89.0	53	53
0.71-0.8	26	43.3	0	43.3	26	26
0.81-0.9	18	30.0	2	28.0	16	16
0.91-1.0	7	11.7	0	11.7	7	7
1.01-1.1	0	0.0	0	0.0	0	0
1.11-1.2	0	0.0	0	0.0	0	0
1.21-1.3	0	0.0	0	0.0	0	0
1.31-1.4	1	1.7	0	1.7	0	1
1.41-1.5	3	5.0	1	4.0	0	2
1.51-1.6	2	3.3	0	3.3	0	2
>1.6	0	0.0	0	0.0	0	0
Total	1023	1705.0	10	1695.0	1007	1013

Table 4-6
Voltage Growth Distributions

Voltage Growth Per EFPY	Number of Indications				Cumulative Percent				
	A	B	C	D	A	B	C	D	Bounding
<=0.0	68	30	173	94	40.0	24.0	39.5	33.0	24.0
0.01-0.1	48	34	176	80	68.2	51.2	79.7	61.1	51.2
0.11-0.2	33	36	62	71	87.6	80.0	93.8	86.0	80.0
0.21-0.3	15	13	19	19	96.5	90.4	98.2	92.6	90.4
0.31-0.4	4	9	5	14	98.8	97.6	99.3	97.5	97.5
0.41-0.5	1	2	2	3	99.4	99.2	99.8	98.6	98.6
0.51-0.6	0	0	0	2	99.4	99.2	99.8	99.3	99.2
0.61-0.7	1	1	0	2	100.0	100.0	99.8	100.0	99.8
0.71-0.8	0	0	0	0	100.0	100.0	99.8	100.0	99.8
0.81-0.9	0	0	0	0	100.0	100.0	99.8	100.0	99.8
0.91-1.0	0	0	1	0	100.0	100.0	100.0	100.0	100.0
1.01-1.1	0	0	0	0	100.0	100.0	100.0	100.0	100.0
1.11-1.2	0	0	0	0	100.0	100.0	100.0	100.0	100.0
1.21-1.3	0	0	0	0	100.0	100.0	100.0	100.0	100.0
1.31-1.4	0	0	0	0	100.0	100.0	100.0	100.0	100.0
1.41-1.5	0	0	0	0	100.0	100.0	100.0	100.0	100.0
>1.5	0	0	0	0	100.0	100.0	100.0	100.0	100.0
Total	170	125	438	285					

Table 4-7
NDE Uncertainty Values

Analyst Uncertainty

Percent Variation	Cumulative Probability
-40.0%	0.00005
-38.0%	0.00011
-36.0%	0.00024
-34.0%	0.00048
-32.0%	0.00095
-30.0%	0.00179
-28.0%	0.00328
-26.0%	0.00580
-24.0%	0.00990
-22.0%	0.01634
-20.0%	0.02608
-18.0%	0.04027
-16.0%	0.06016
-14.0%	0.08704
-12.0%	0.12200
-10.0%	0.16581
-8.0%	0.21867
-6.0%	0.28011
-4.0%	0.34888
-2.0%	0.42302
0.0%	0.50000
2.0%	0.57698
4.0%	0.65112
6.0%	0.71989
8.0%	0.78133
10.0%	0.83419
12.0%	0.87800
14.0%	0.91296
16.0%	0.93984
18.0%	0.95973
20.0%	0.97392
22.0%	0.98366
24.0%	0.99010
26.0%	0.99420
28.0%	0.99672
30.0%	0.99821
32.0%	0.99905
34.0%	0.99952
36.0%	0.99976
38.0%	0.99989
40.0%	0.99995

Std Deviation = 10.3%
Mean = 0.0%
No Cutoff

Acquisition Uncertainty

Percent Variation	Cumulative Probability
<-15.0%	0.00000
-15.0%	0.01606
-14.0%	0.02275
-13.0%	0.03165
-12.0%	0.04324
-11.0%	0.05804
-10.0%	0.07656
-9.0%	0.09927
-8.0%	0.12655
-7.0%	0.15866
-6.0%	0.19568
-5.0%	0.23753
-4.0%	0.28385
-3.0%	0.33412
-2.0%	0.38755
-1.0%	0.44320
0.0%	0.50000
1.0%	0.55680
2.0%	0.61245
3.0%	0.66588
4.0%	0.71615
5.0%	0.76247
6.0%	0.80432
7.0%	0.84134
8.0%	0.87345
9.0%	0.90073
10.0%	0.92344
11.0%	0.94196
12.0%	0.95676
13.0%	0.96835
14.0%	0.97725
15.0%	0.98394
>15.0%	1.00000

Std Deviation = 7.0%
Mean = 0.0%
Cutoff = +/- 15.0%

Table 4-8
Projected EOC7 Voltage Distributions

Voltage Bin	Projected No. Of Indications At EOC7				
	S/G A	S/G B	S/G C	S/G D	Total
0.0-0.1	0.6	0.0	0.0	0.6	1.3
0.11-0.2	6.8	3.5	22.4	7.6	40.3
0.21-0.3	19.5	16.2	75.8	33.2	144.6
0.31-0.4	34.0	28.2	111.2	67.3	240.7
0.41-0.5	44.2	33.0	126.5	81.8	285.5
0.51-0.6	45.0	33.0	112.0	79.9	269.9
0.61-0.7	40.8	27.9	89.4	66.5	224.6
0.71-0.8	31.7	21.8	67.1	49.5	170.1
0.81-0.9	22.9	15.4	46.7	33.8	118.9
0.91-1.0	15.3	10.1	31.0	20.5	76.9
1.01-1.1	9.6	6.4	19.6	11.7	47.5
1.11-1.2	6.0	3.9	12.0	6.6	28.6
1.21-1.3	3.5	2.3	7.1	3.7	16.6
1.31-1.4	2.0	1.3	4.0	2.1	9.4
1.41-1.5	1.1	0.8	2.5	1.5	5.9
1.51-1.6	0.6	0.5	1.8	1.4	4.3
1.61-1.7	0.4	0.4	1.3	1.2	3.3
1.71-1.8	0.2	0.2	0.9	1.0	2.4
1.81-1.9	0.1	0.2	0.6	0.7	1.6
1.91-2.0	0.1	0.1	0.4	0.5	1.1
2.01-2.1	0.0	0.1	0.2	0.3	0.7
2.11-2.2	0.0	0.0	0.2	0.2	0.4
2.21-2.3	0.0	0.0	0.1	0.1	0.2
2.31-2.4	0.0	0.0	0.0	0.1	0.1
2.41-2.5	0.0	0.0	0.0	0.0	0.1
2.51-2.6	0.0	0.0	0.0	0.0	0.0
2.61-2.7	0.0	0.0	0.0	0.0	0.0
2.71-2.8	0.0	0.0	0.0	0.0	0.0
2.81-2.9	0.0	0.0	0.0	0.0	0.0
2.91-3.0	0.0	0.0	0.0	0.0	0.0
>3.0	0.0	0.0	0.0	0.0	0.0
Total	285.0	205.3	732.7	472.0	1695.0

Figure 4-1

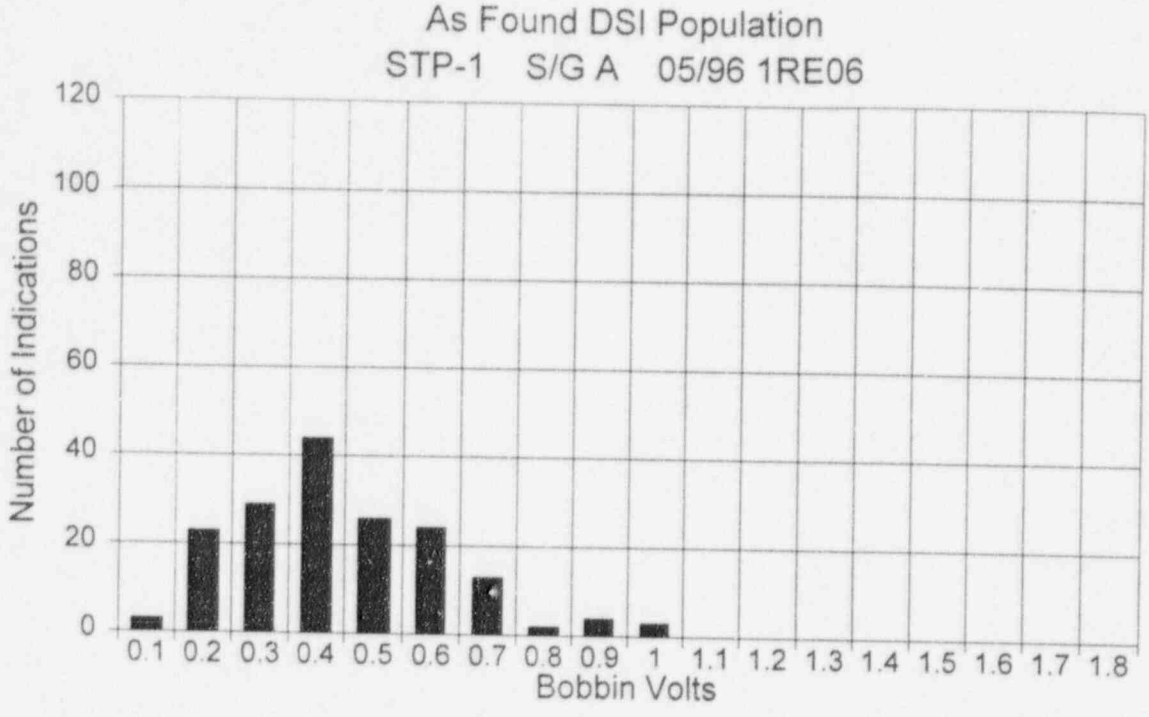


Figure 4-2

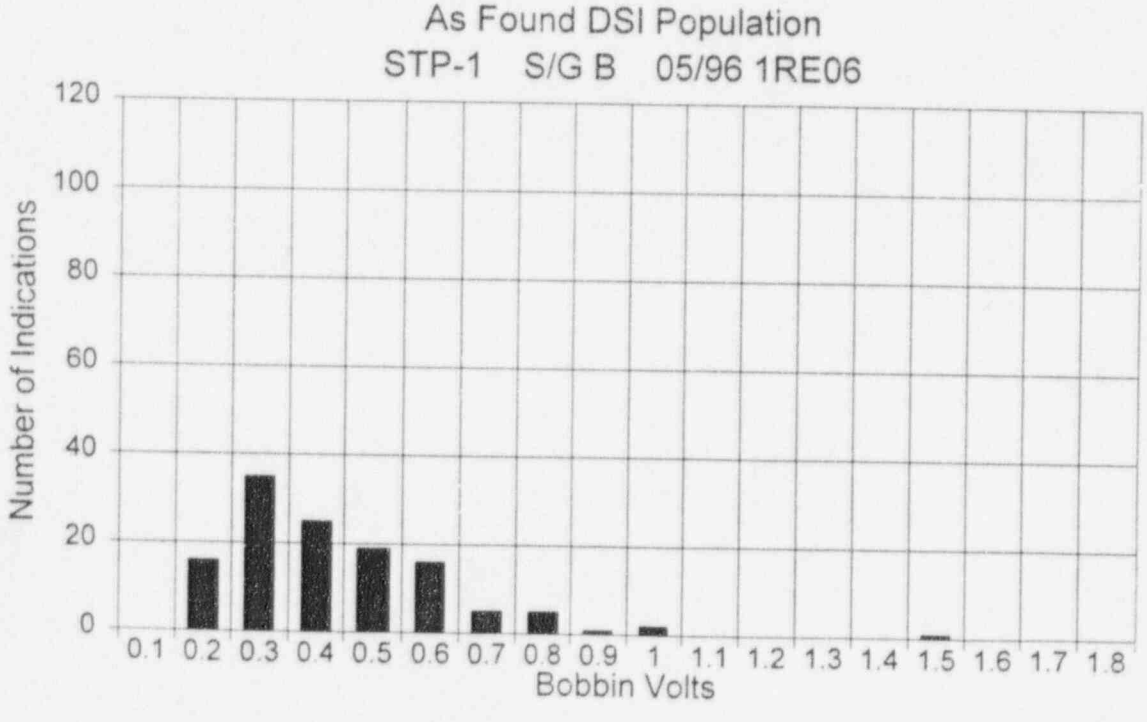


Figure 4-3

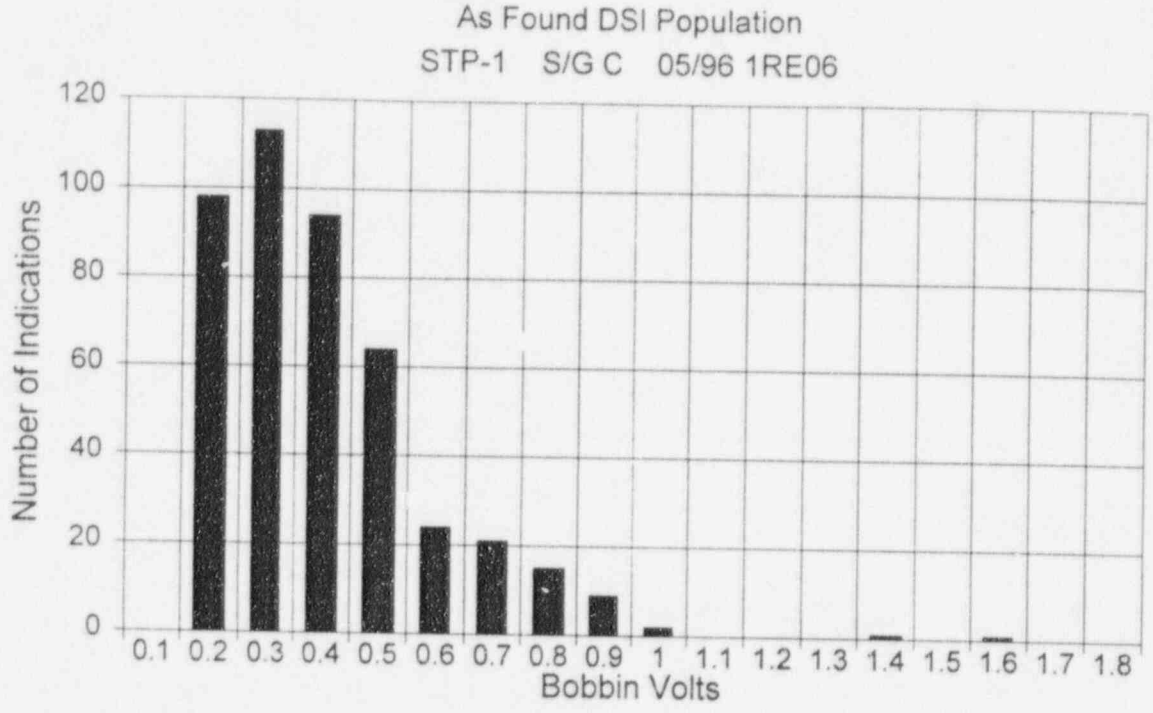


Figure 4-4

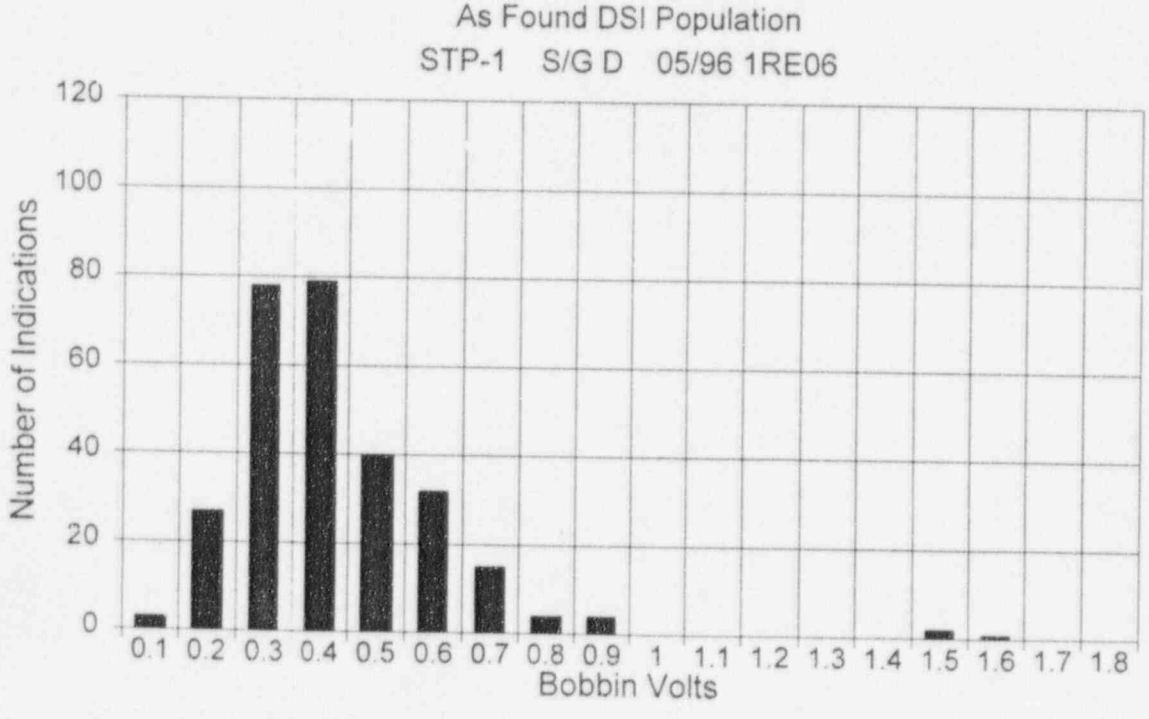


Figure 4-5

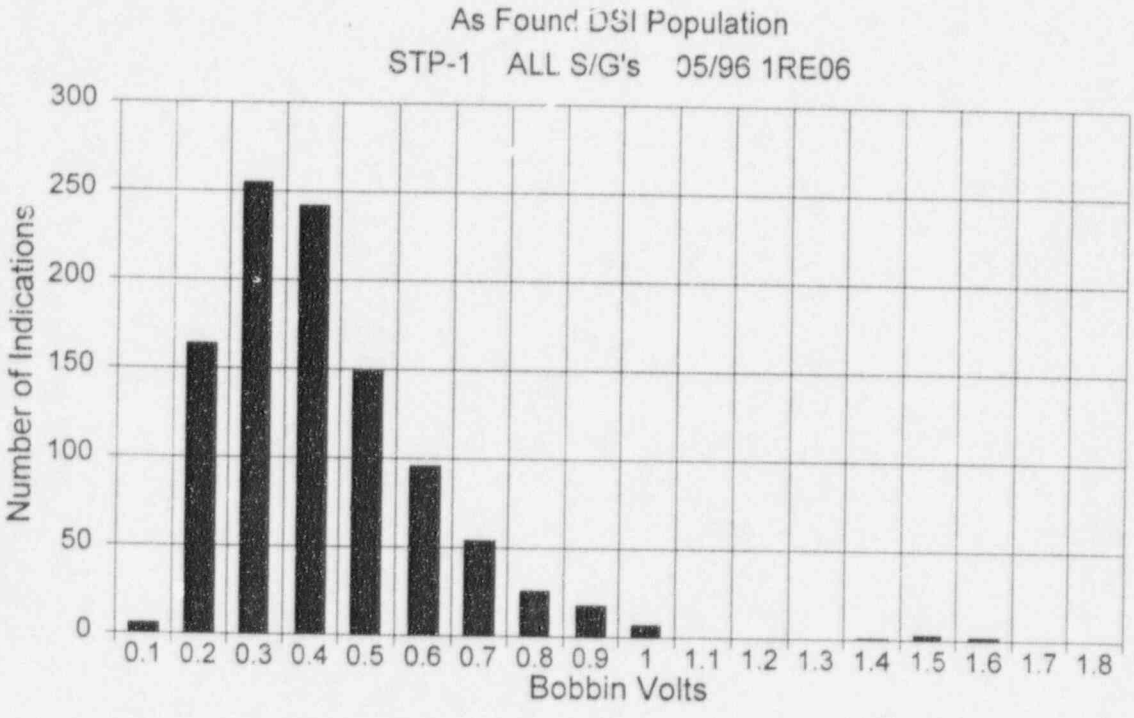

As Found DSI Population
STP-1 ALL S/G's 05/96 1RE06
Number of Indications
300
250
200
150
100
50
0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8
Bobbin Volts

Figure 4-6

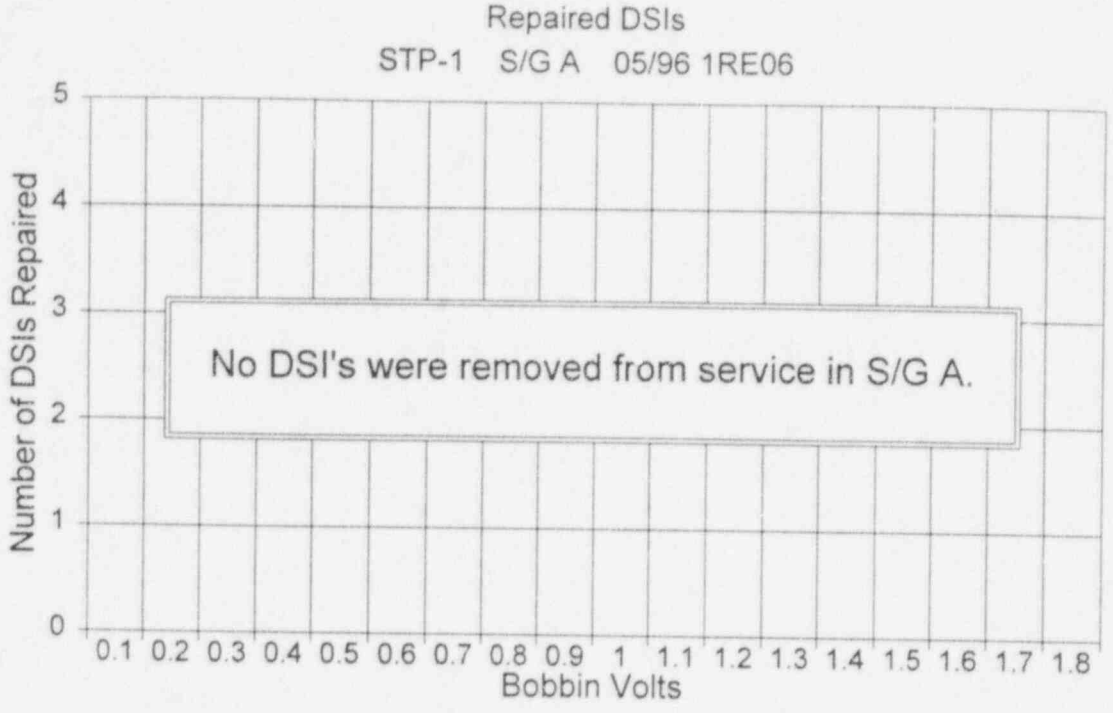


Figure 4-7

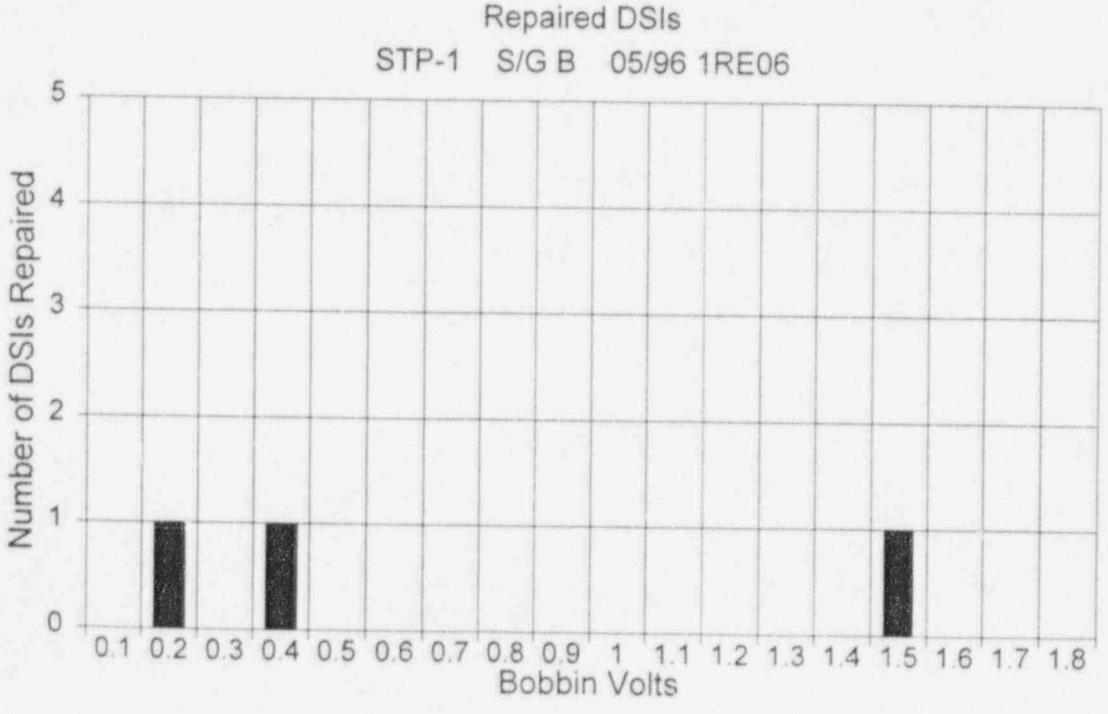


Figure 4-8

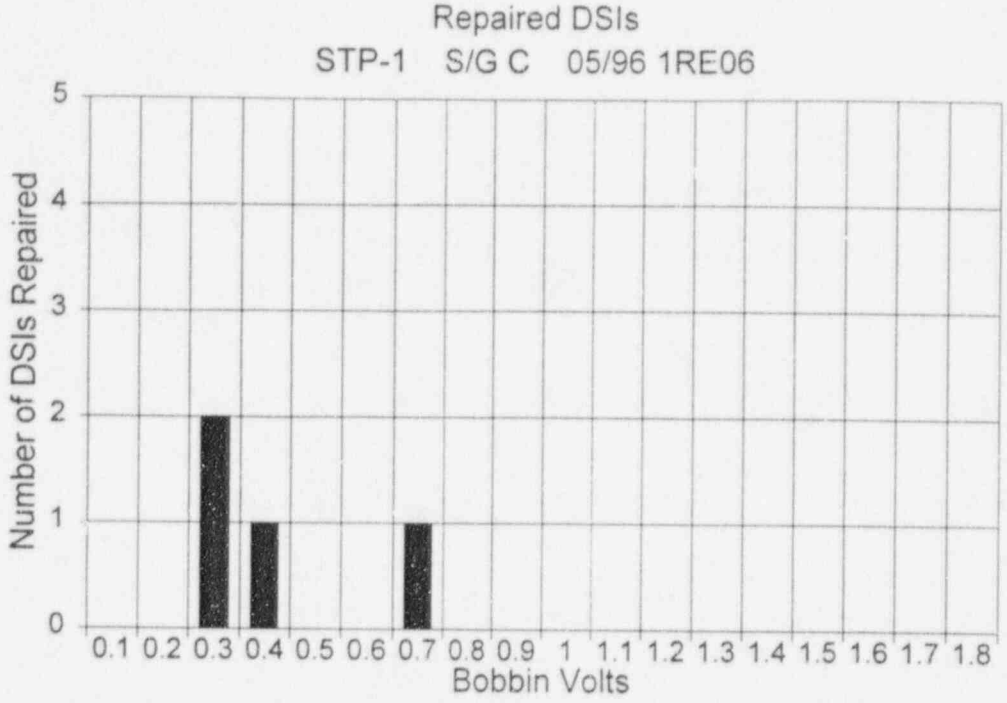


Figure 4-9

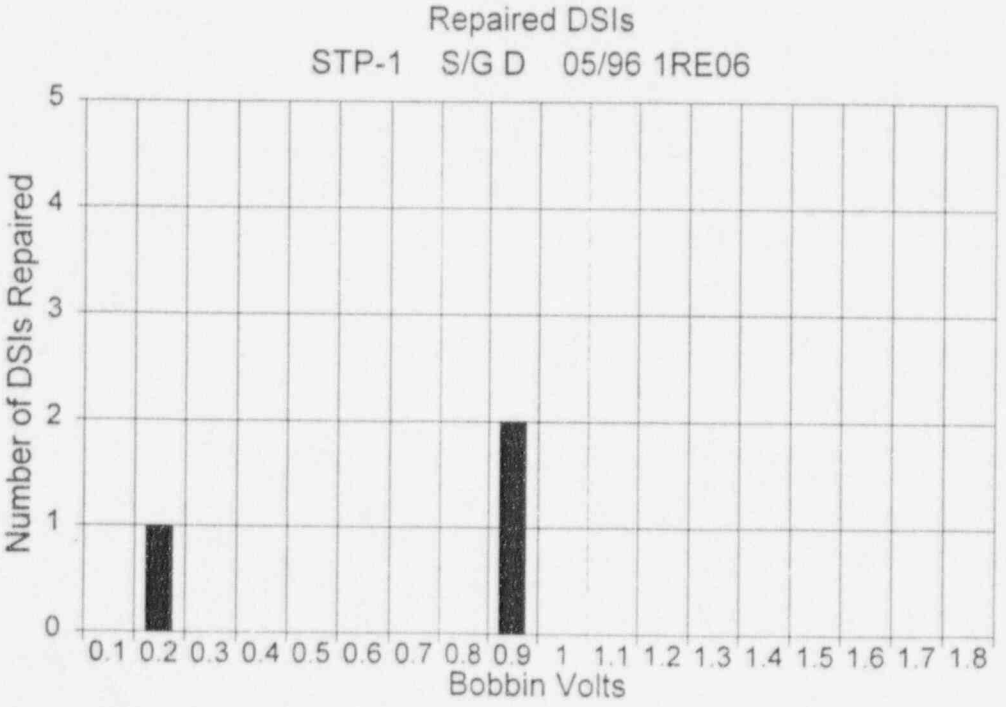


Figure 4-10

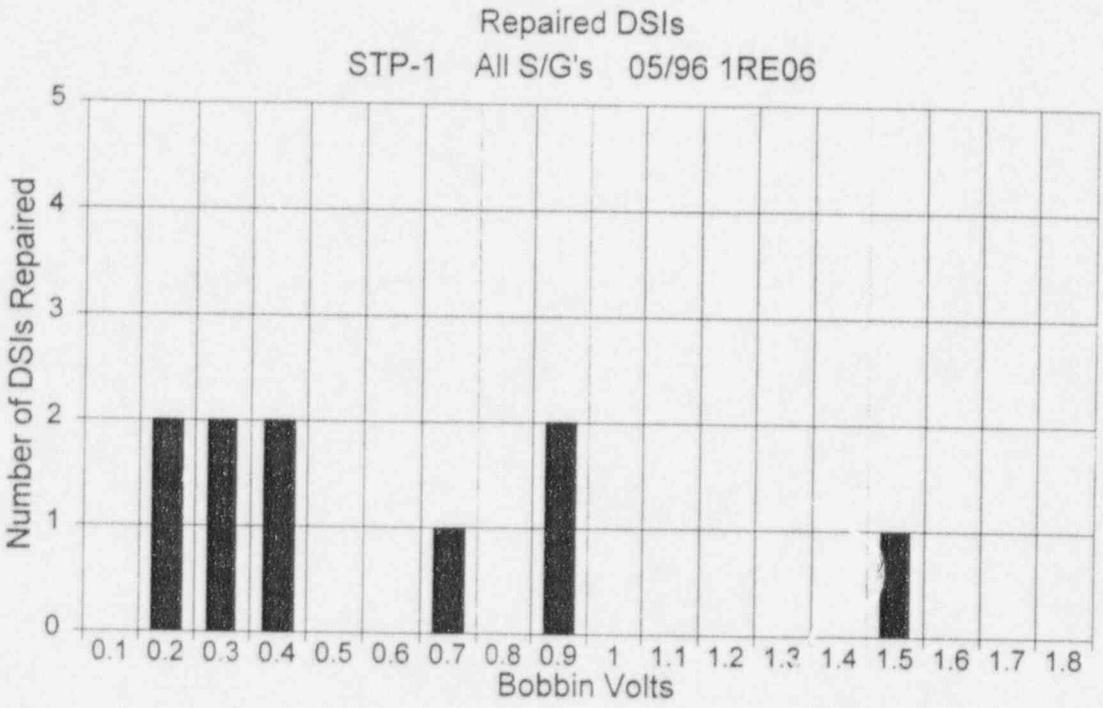

Repaired DSIs
STP-1 All S/G's 05/96 1RE06
Number of DSIs Repaired
0
1
2
3
4
5
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8
Bobbin Volts

Figure 4-11

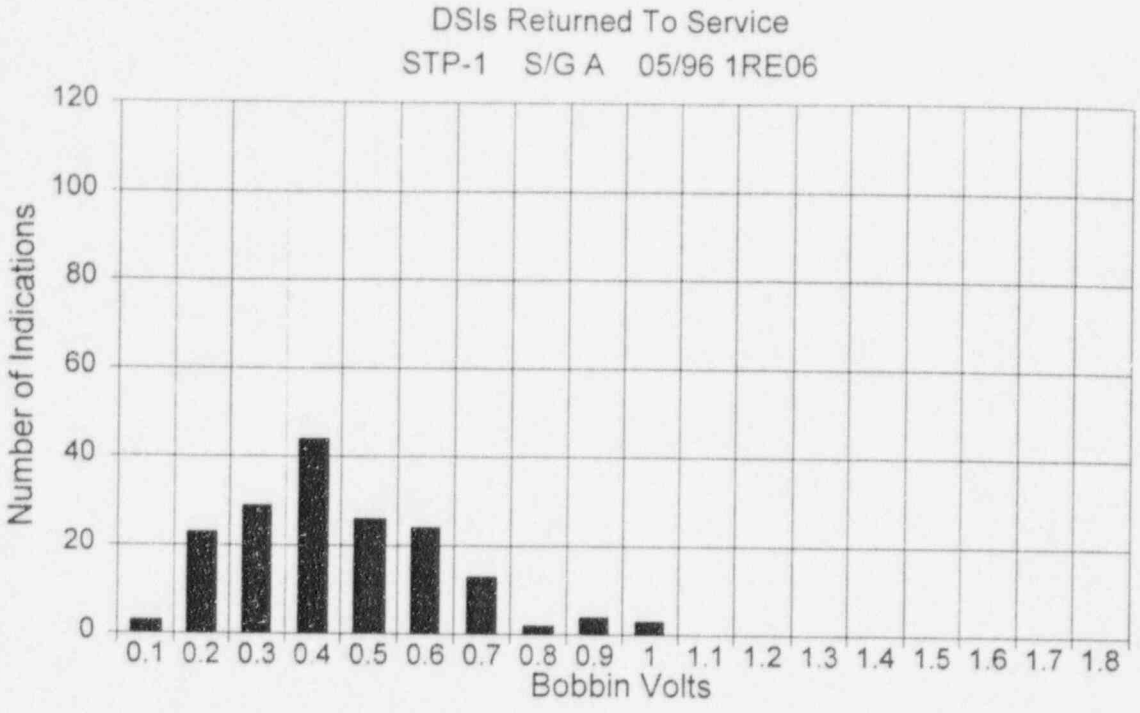


Figure 4-12

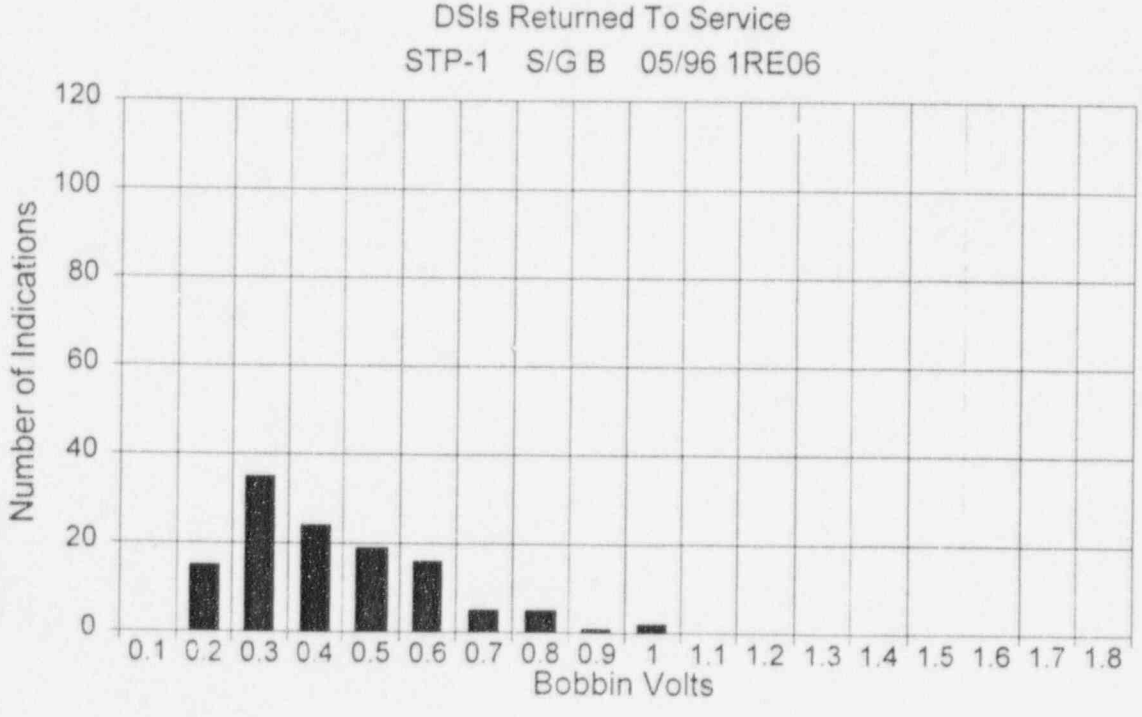


Figure 4-13

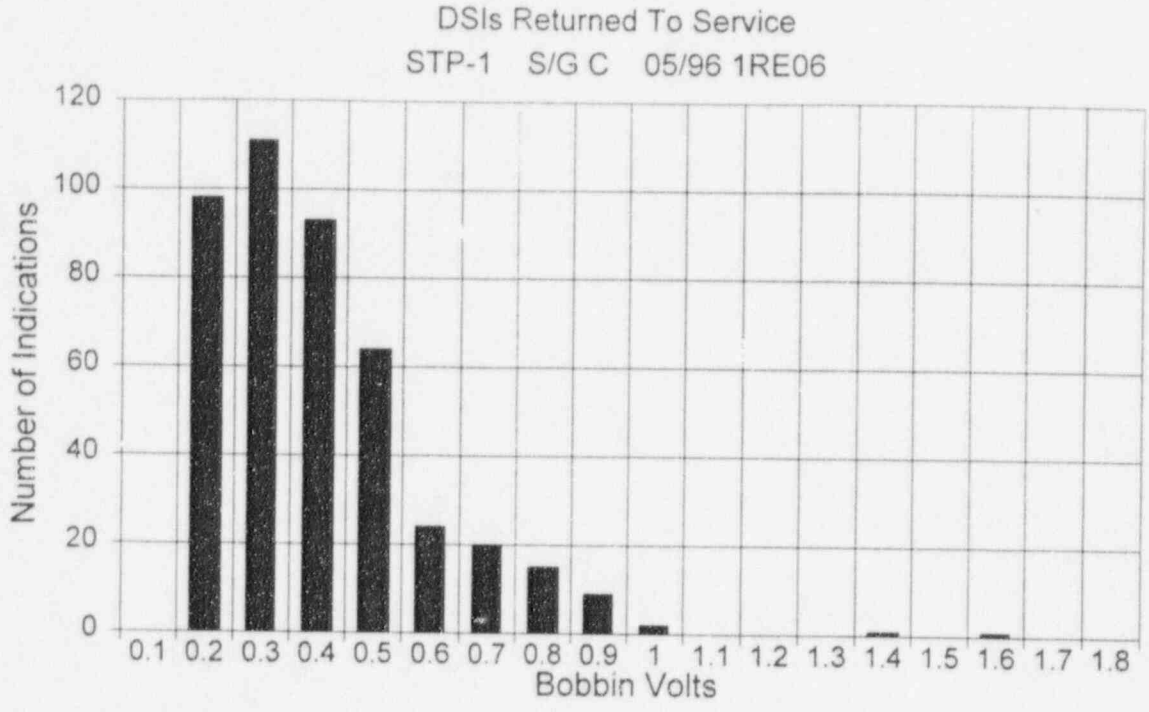


Figure 4-14

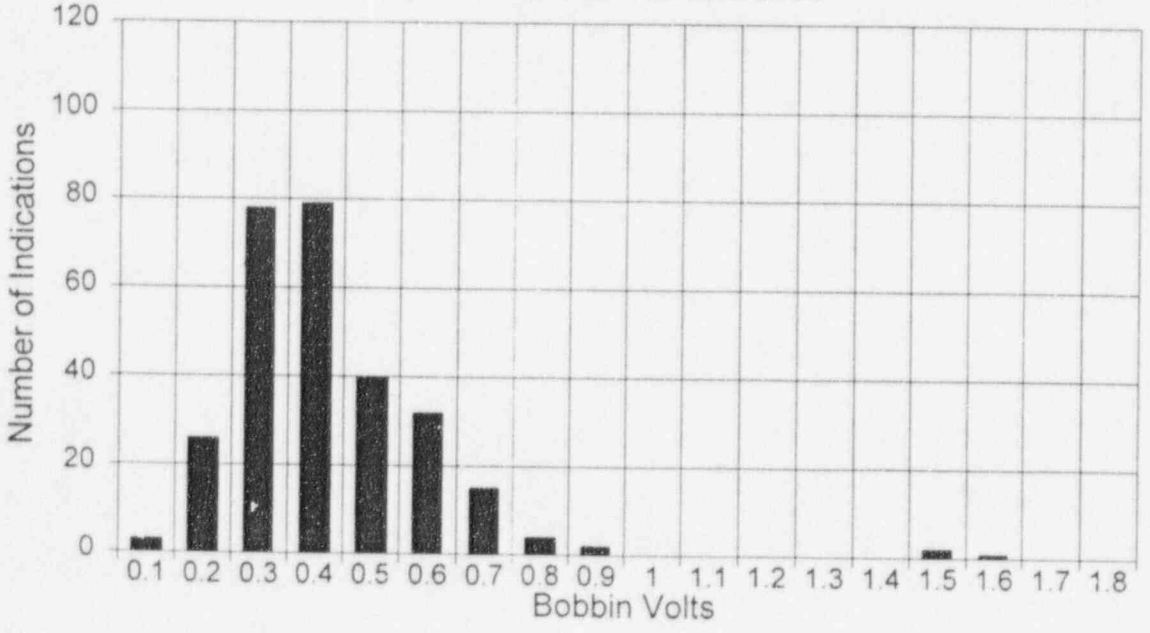


Figure 4-15

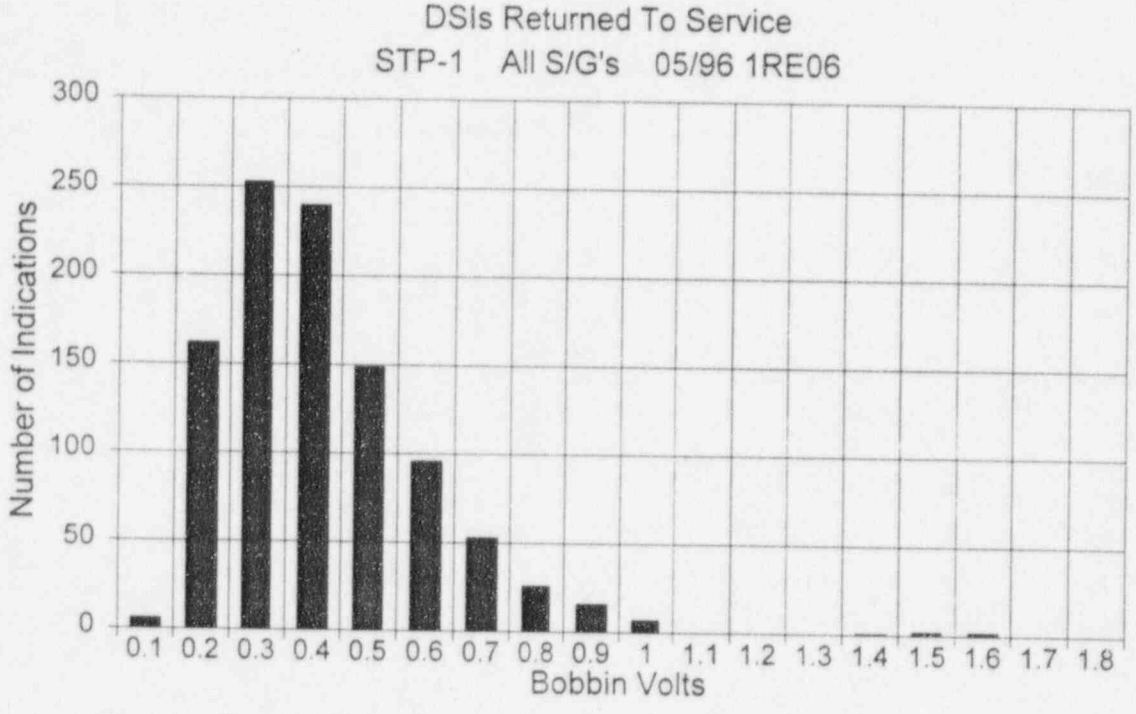

DSIs Returned To Service
STP-1 All S/G's 05/96 1RE06
Number of Indications
300
250
200
150
100
50
0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8
Bobbin Volts

Figure 4-16

DSIs Returned To Service Confirmed As
Crack-Like or Not Inspected w/ MRPC

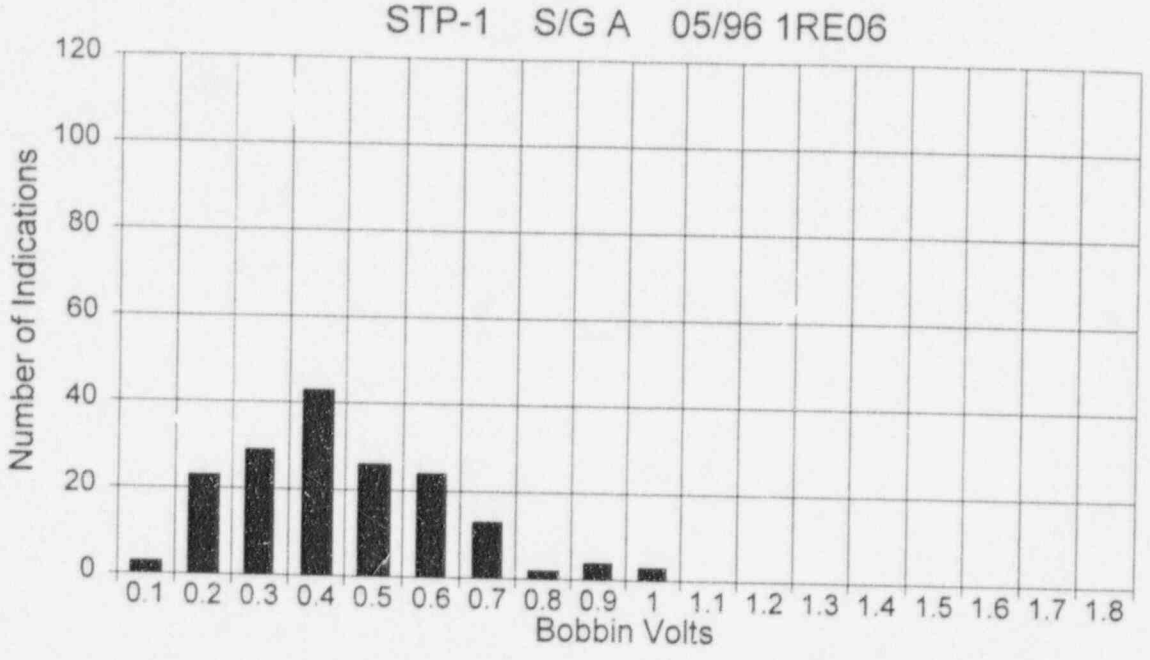


Figure 4-17

DSIs Returned To Service Confirmed As
Crack-Like or Not Inspected w/ MRPC

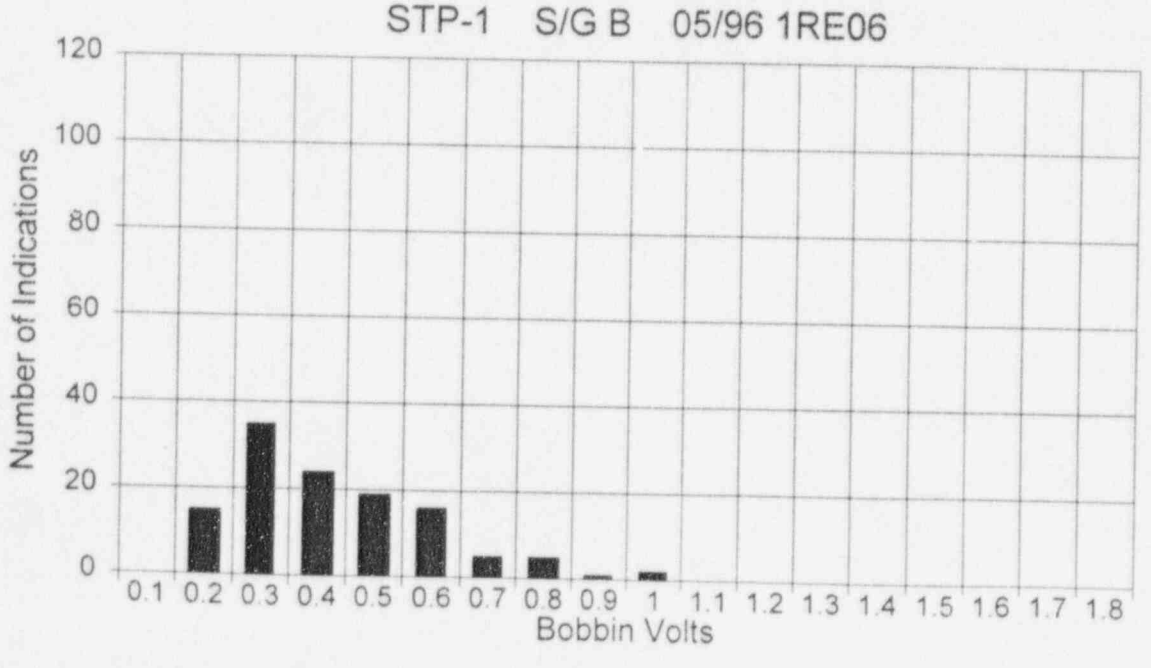


Figure 4-18

DSIs Returned To Service Confirmed As
Crack-Like or Not Inspected w/ MRPC

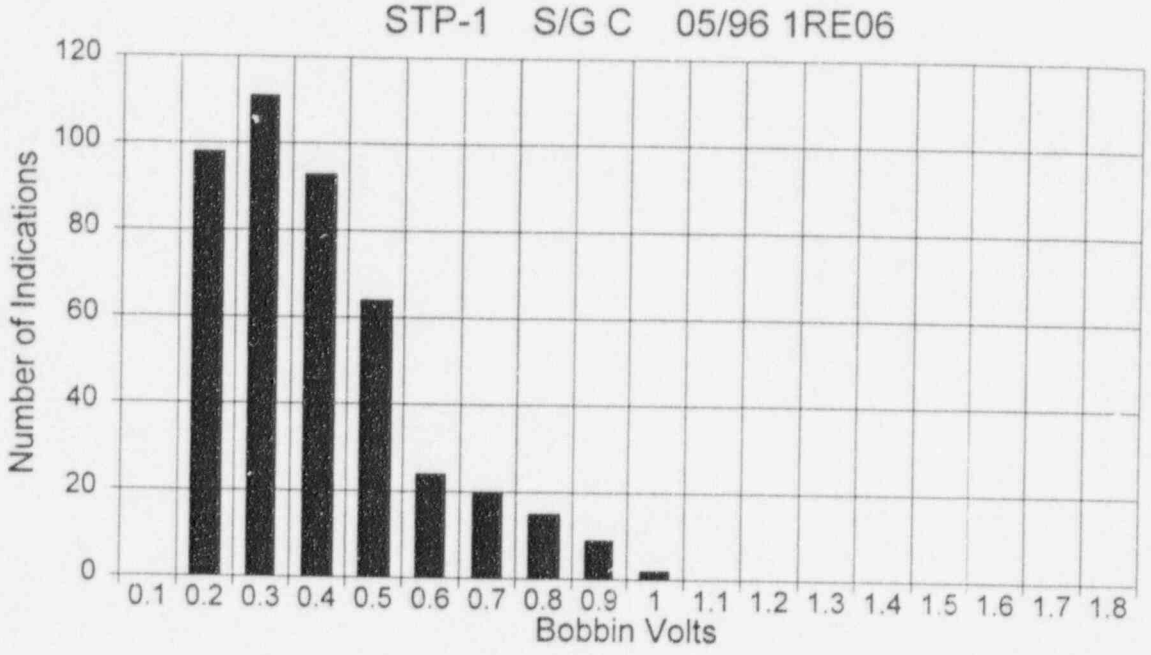


Figure 4-19

DSIs Returned To Service Confirmed As
Crack-Like or Not Inspected w/ MRPC

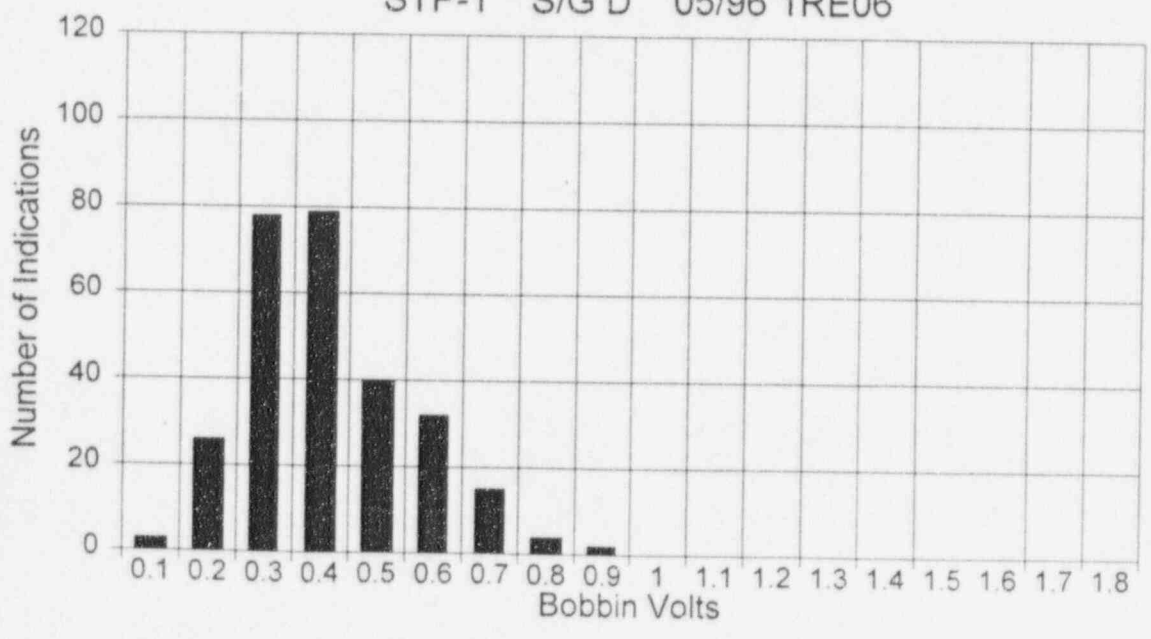


Figure 4-20

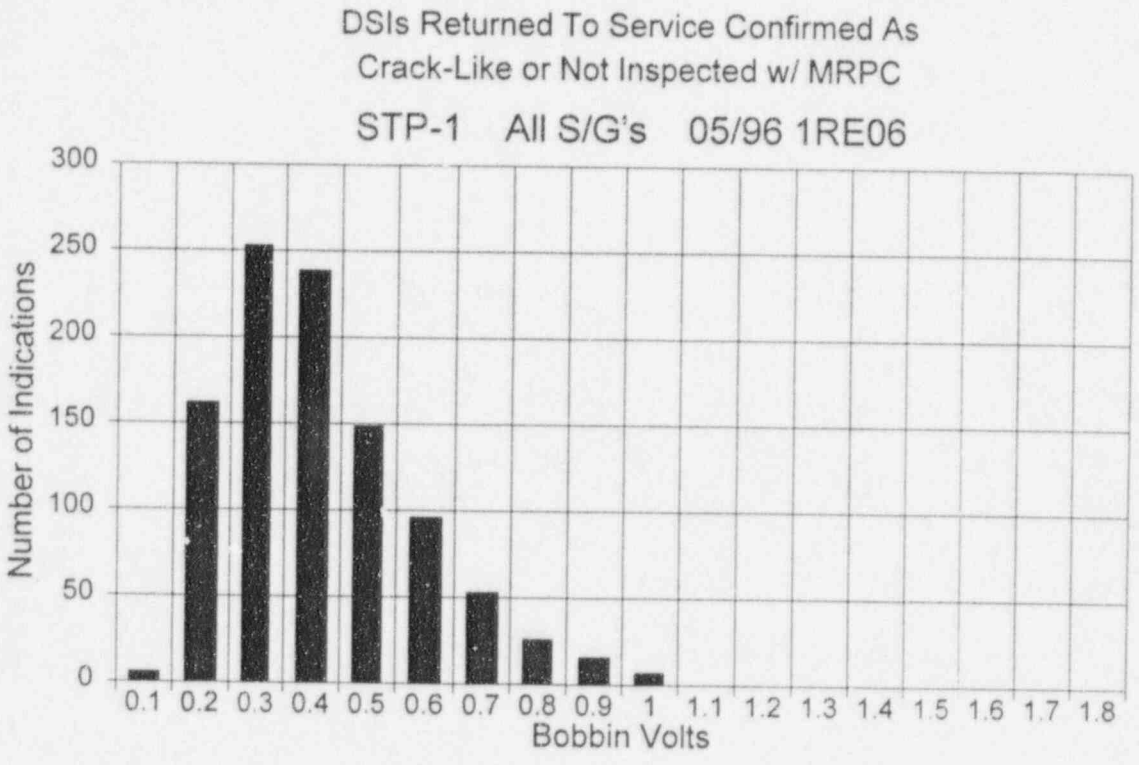

DSIs Returned To Service Confirmed As
Crack-Like or Not Inspected w/ MRPC
STP-1 All S/G's 05/96 1RE06
Number of Indications
300
250
200
150
100
50
0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8
Bobbin Volts

Figure 4-21

BOC7 DSI Population
STP-1 S/G A

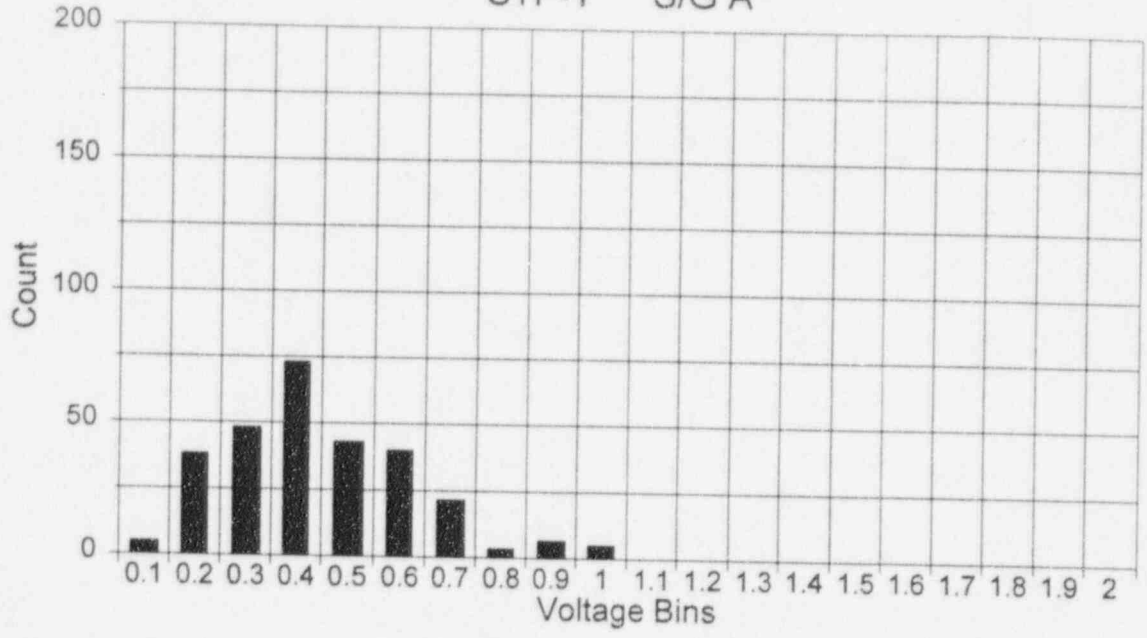


Figure 4-22

BOC7 DSI Population
STP-1 S/G B

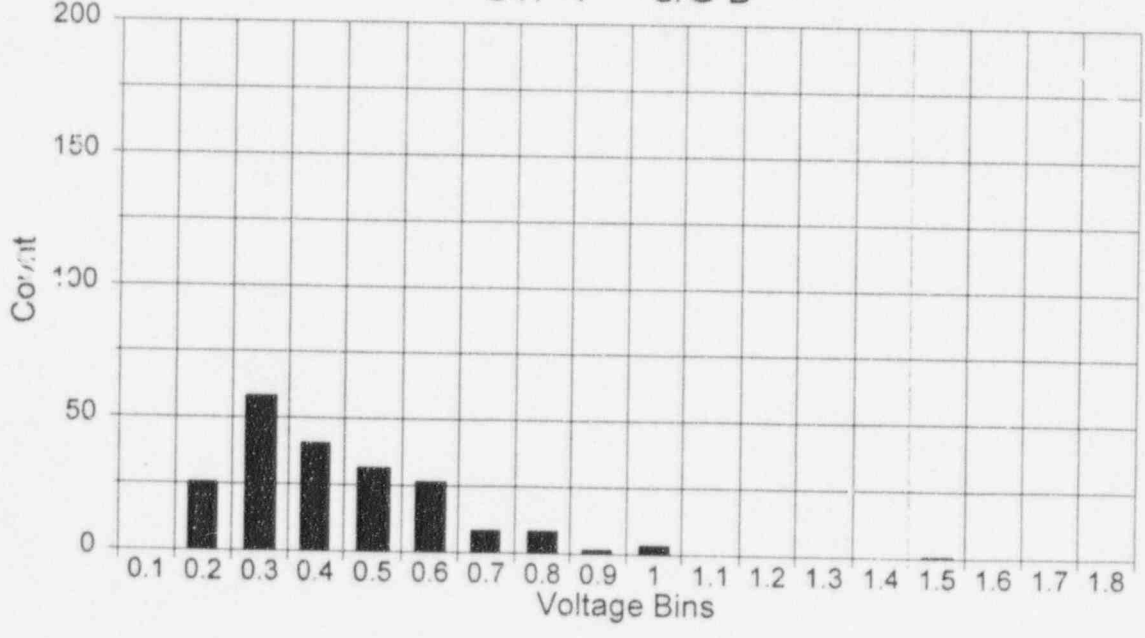


Figure 4-23

BOC7 DSI Population

STP-1 S/G C

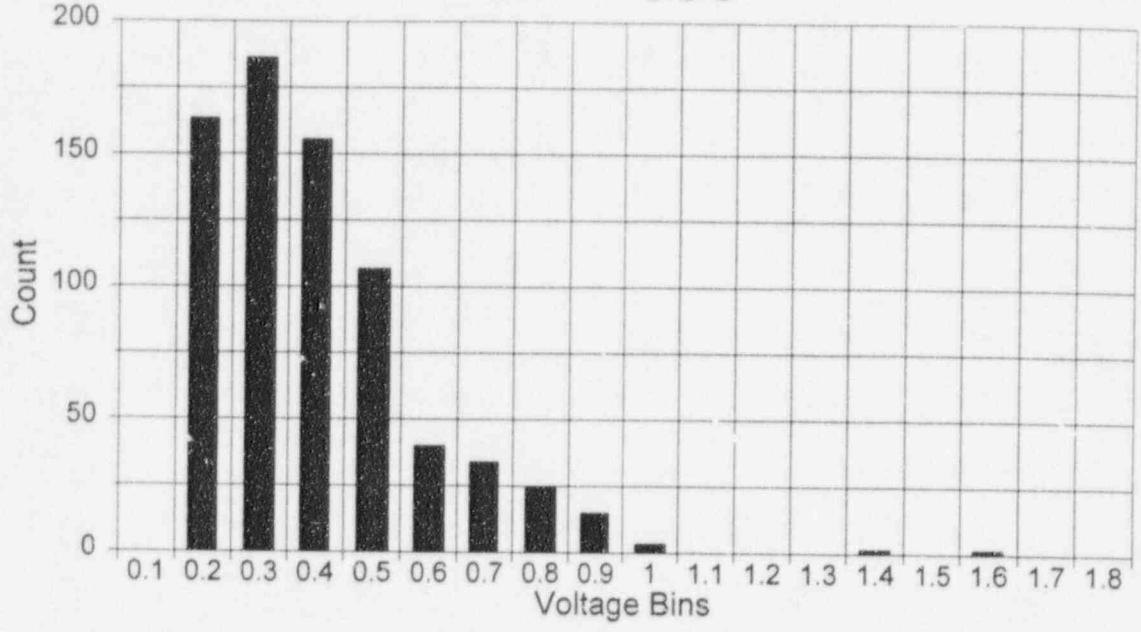


Figure 4-24

BOC7 DSI Population

STP-1 S/G D

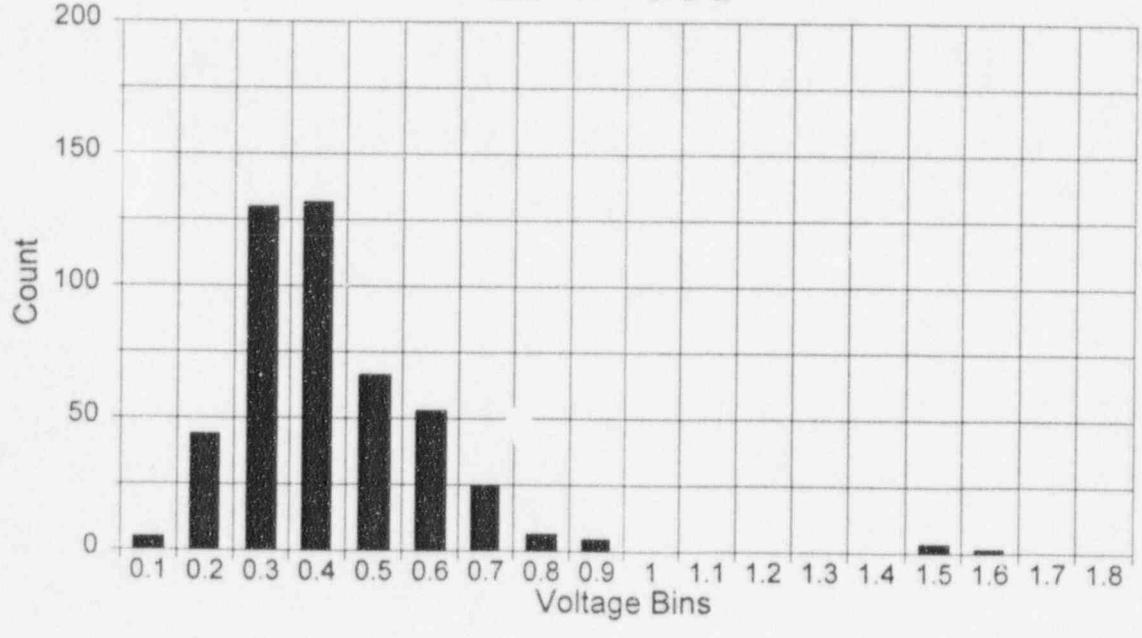


Figure 4-25

BOC7 DSI Population

STP-1 All S/G's

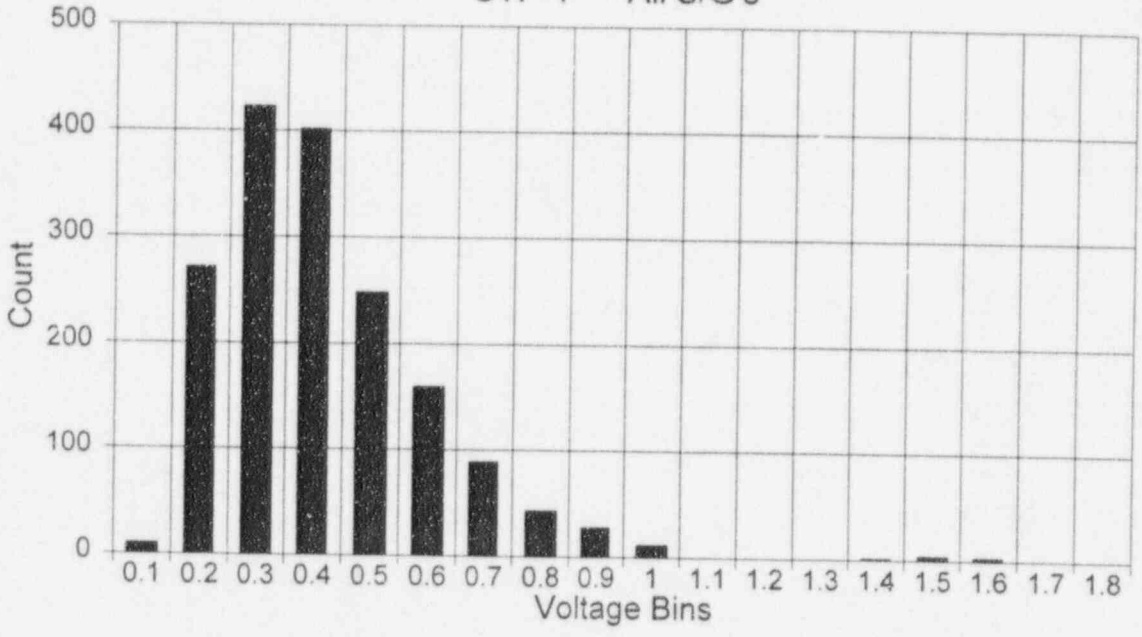


Figure 4-26

Growth Of DSIs

STP-1 S/G A 03/95 to 05/96

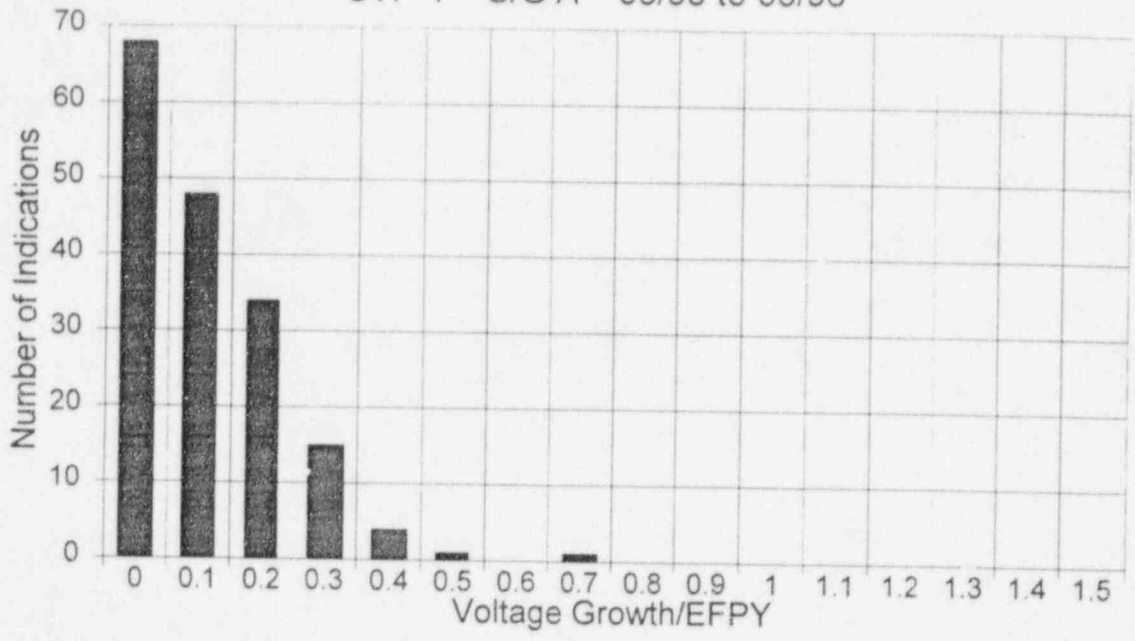


Figure 4-27

Growth Of DSIs

STP-1 S/G B 03/95 to 05/96

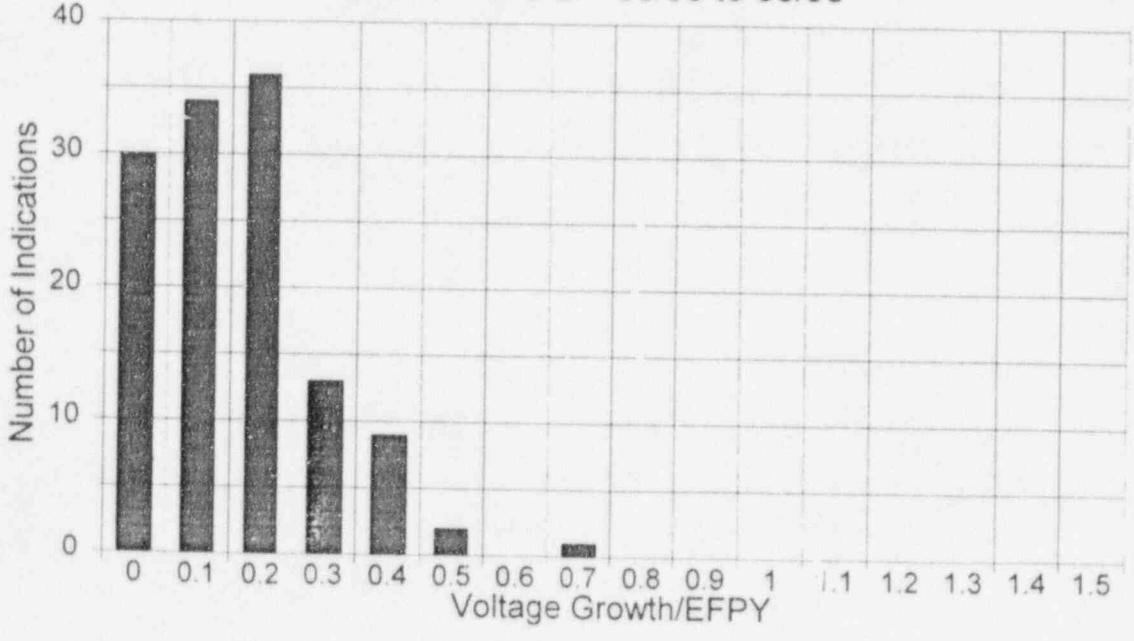


Figure 4-28

Growth Of DSIs

STP-1 S/G C 03/95 to 05/96

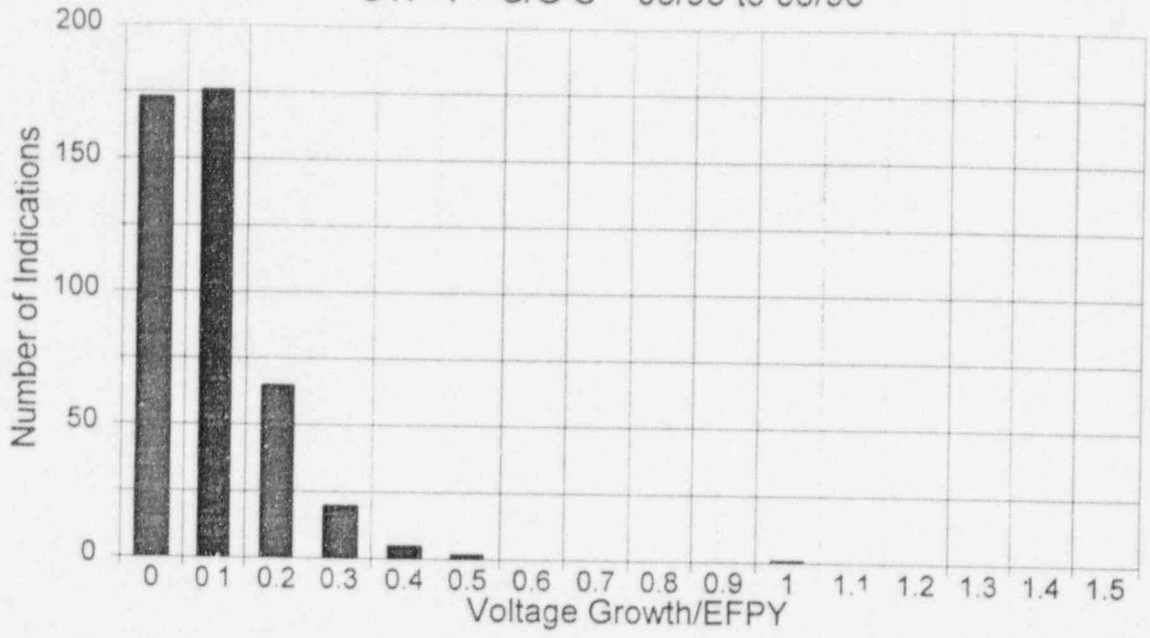


Figure 4-29

Growth Of DSIs

STP-1 S/G D 03/95 to 05/96

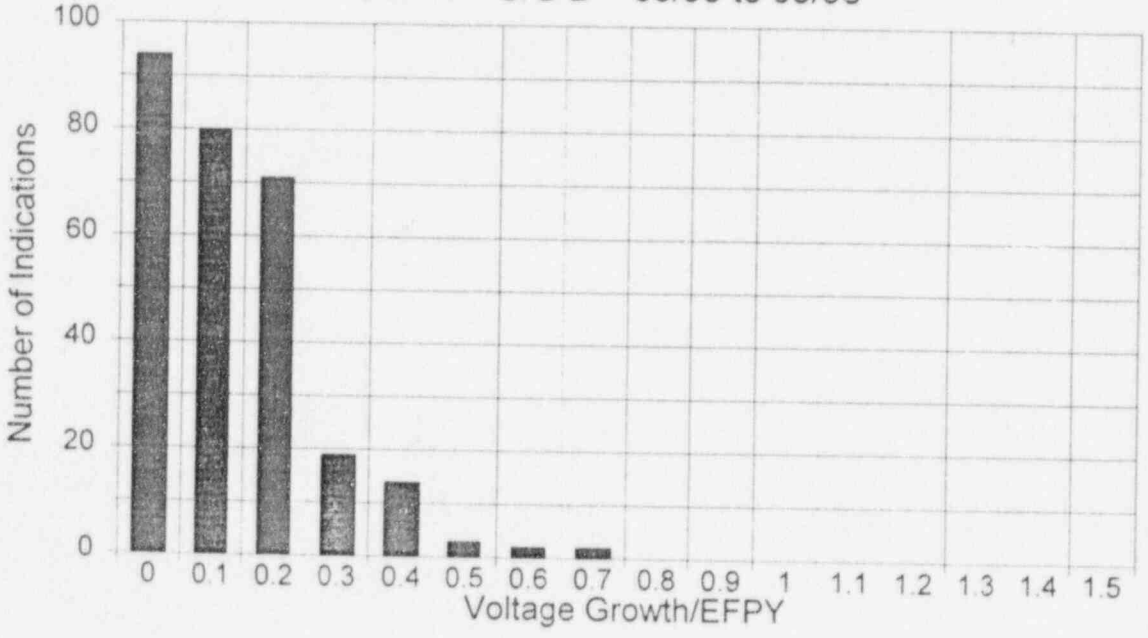


Figure 4-30

Growth Of DSIs

STP-1 All S/G's 03/95 to 05/96

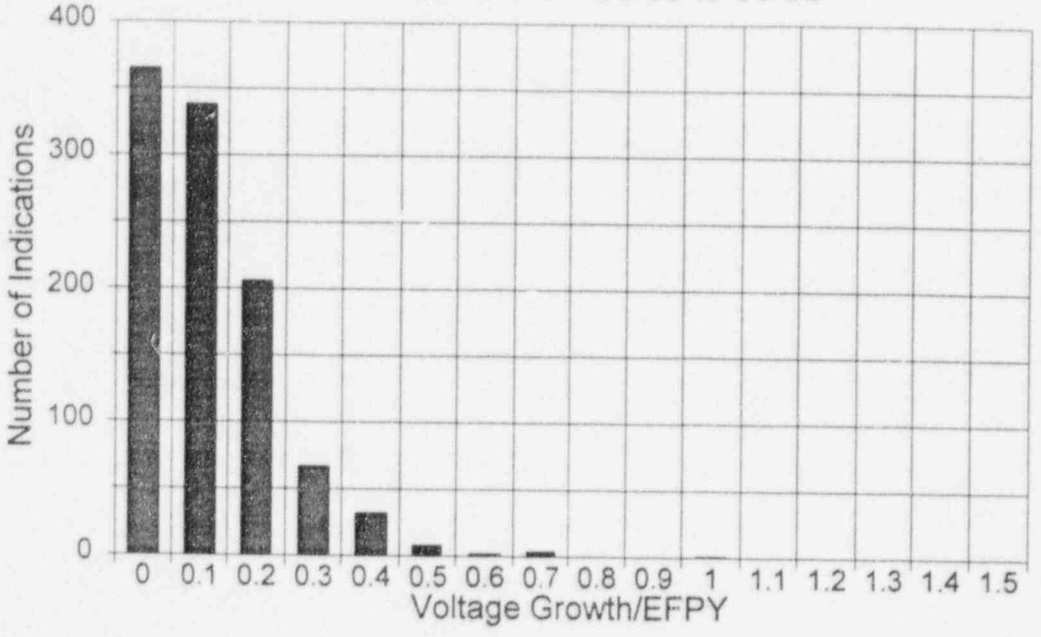


Figure 4-31

Cumulative Growth Distribution

STP-1 All S/Gs 03/95 to 05/96

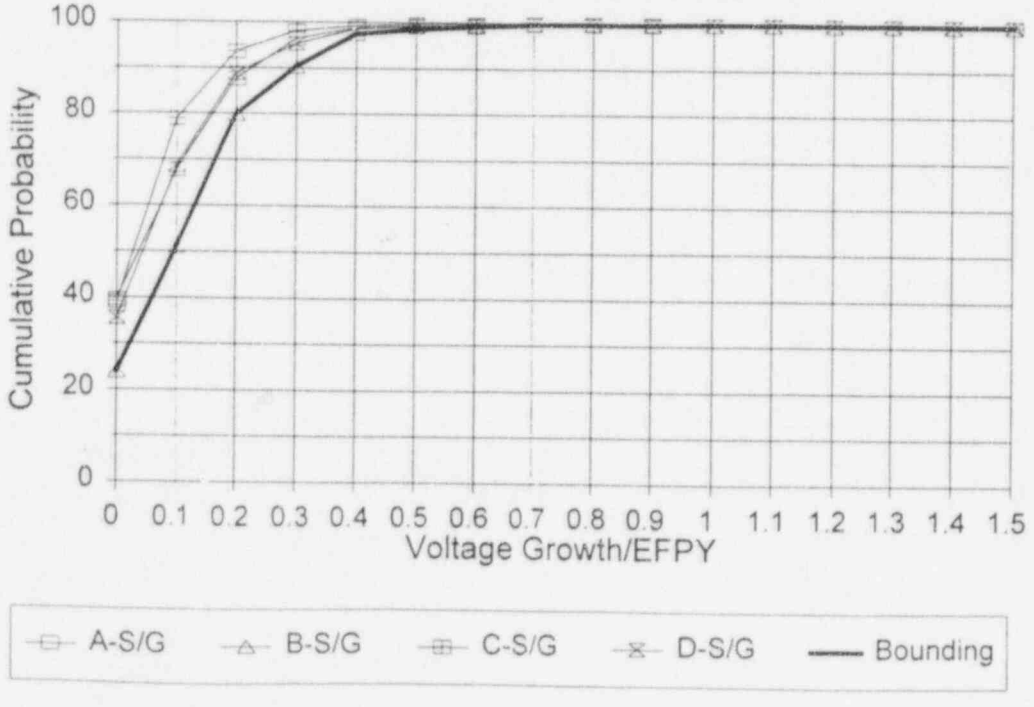


Figure 4-32

NDE UNCERTAINTY DISTRIBUTIONS

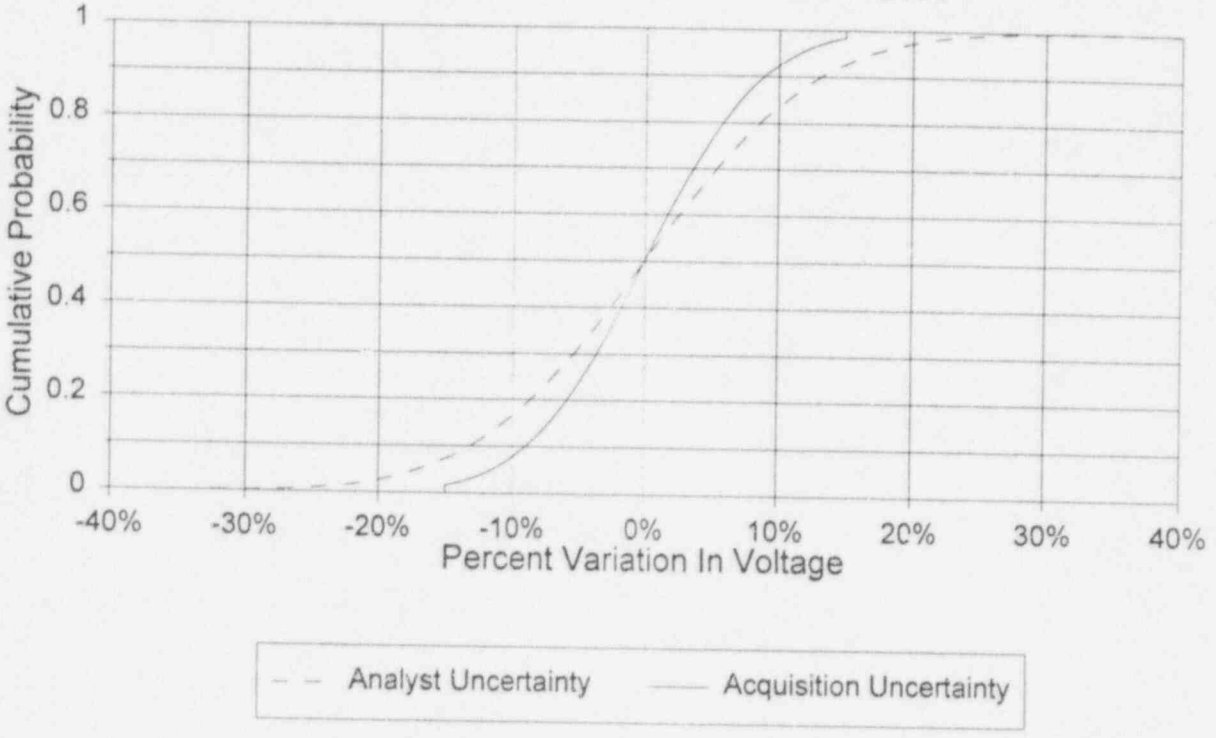


Figure 4-33

Projected EOC7 DSI Population

STP-1 S/G A

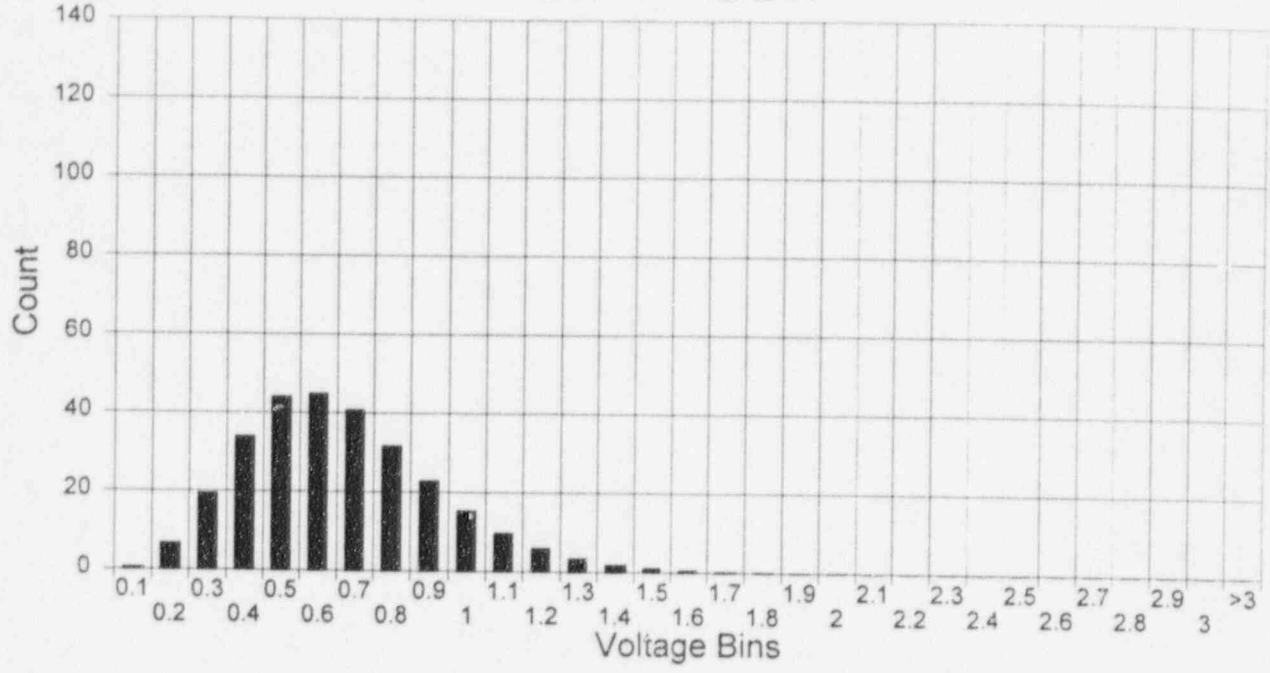


Figure 4-34

Projected EOC7 DSI Population

STP-1 S/G B

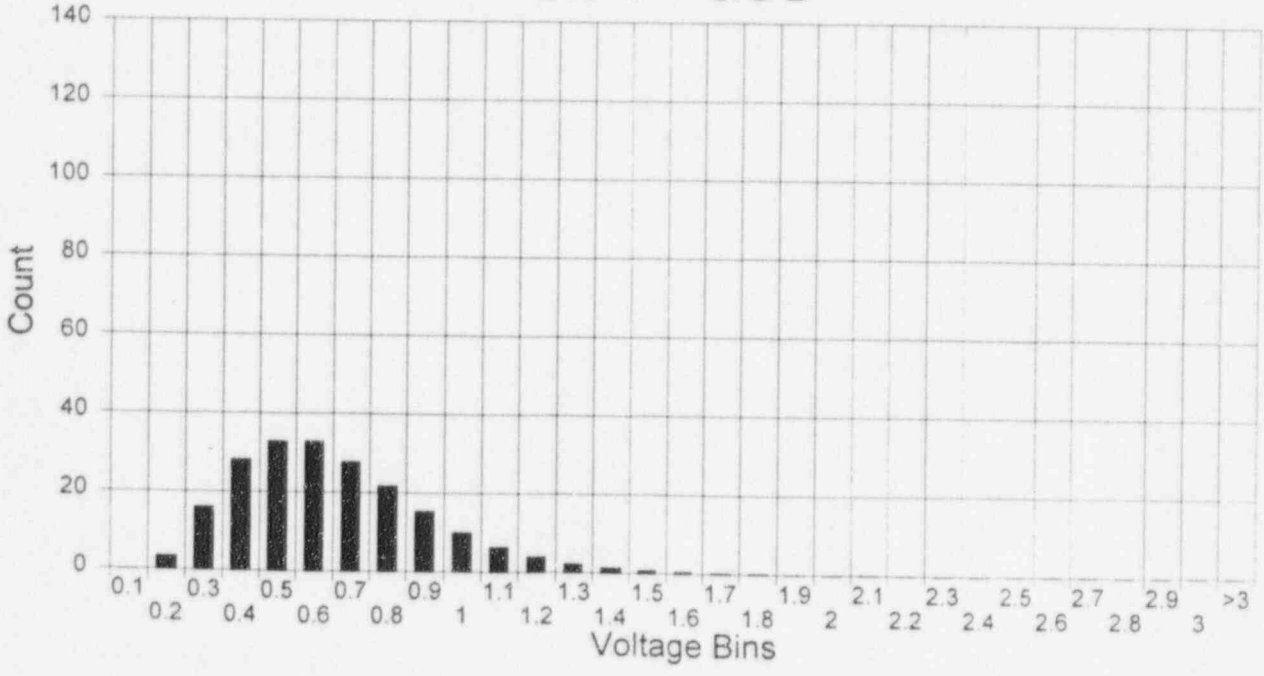


Figure 4-35

Projected EOC7 DSI Population

STP-1 S/G C

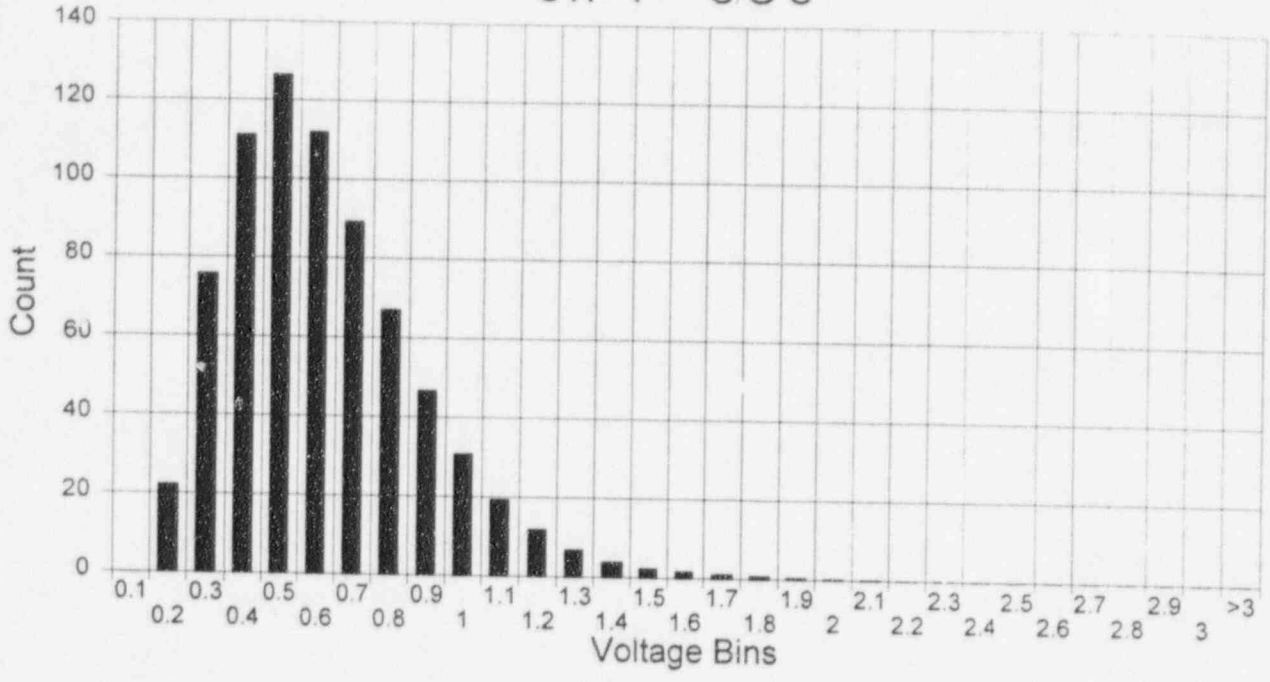


Figure 4-36

Projected EOC7 DSI Population

STP-1 S/G D

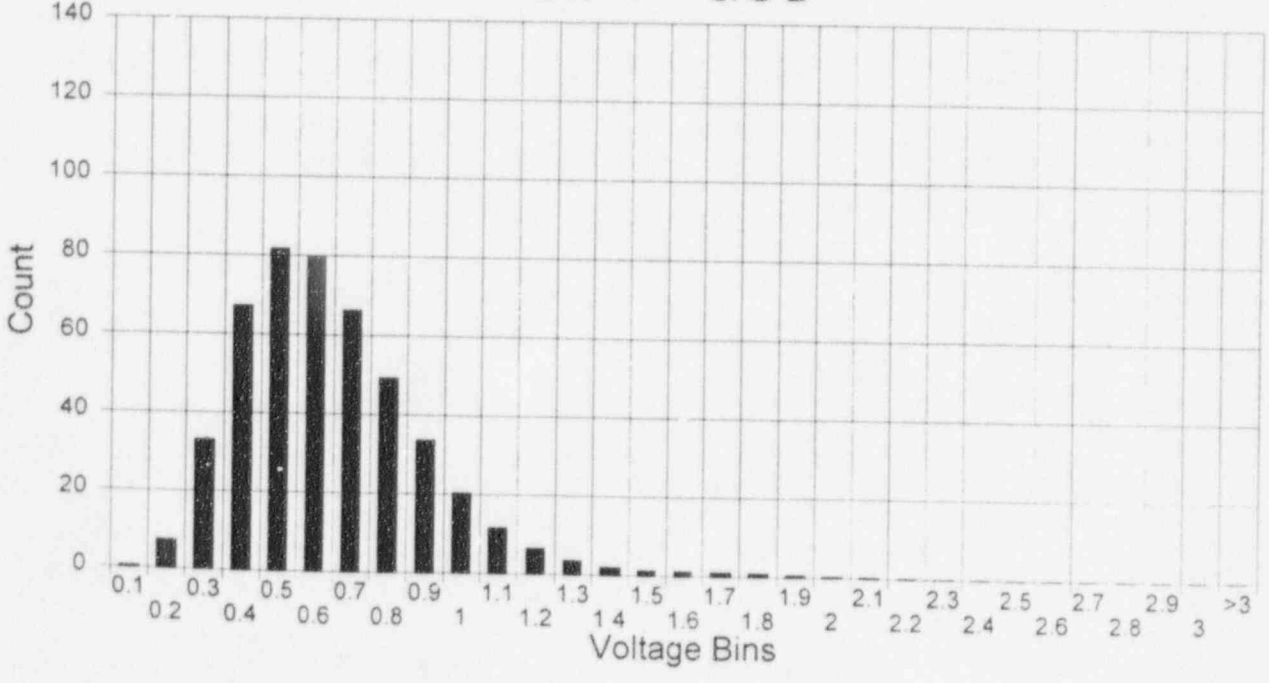
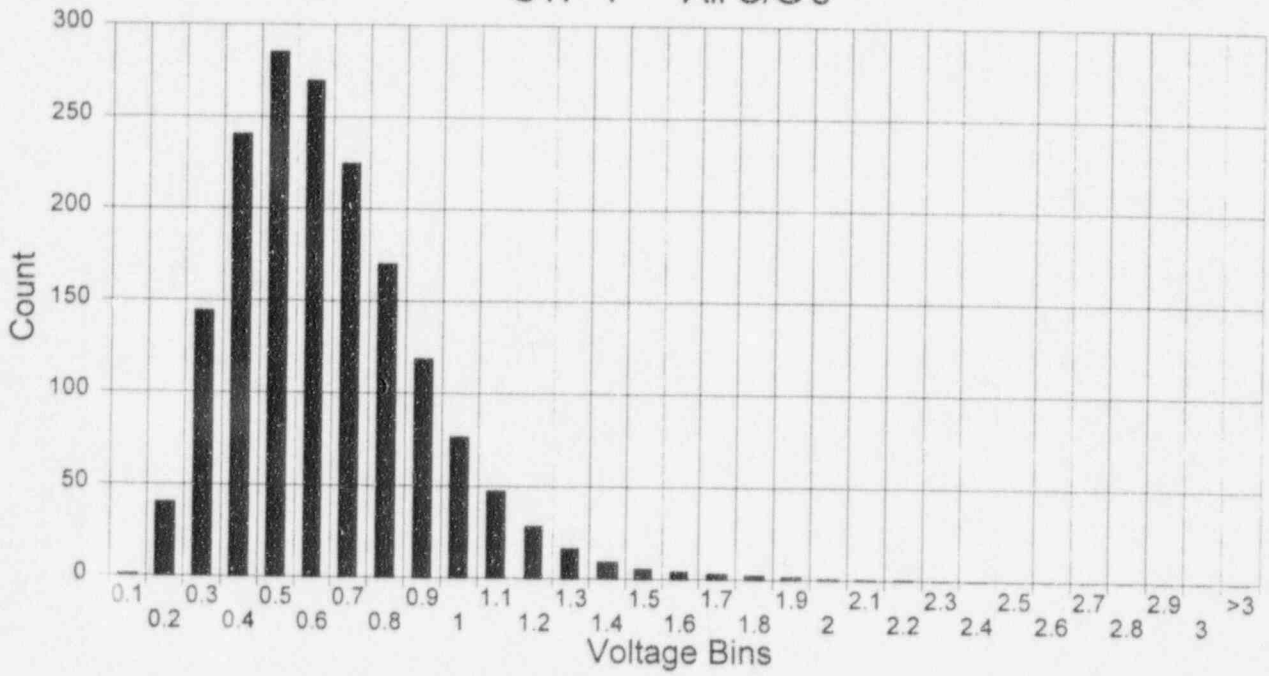


Figure 4-37

Projected EOC7 DSi Population

STP-1 All S/G's



5.0 Tube Integrity Evaluation

Per the Generic Letter, an evaluation should be performed to confirm that the tubes will retain adequate structural and leakage integrity until the next scheduled inspection. The first portion of this evaluation is the calculation of the conditional probability of burst for a steam generator under main steam line break (MSLB) conditions. This conditional probability of burst refers to the probability that the burst pressures associated with one or more indications in the faulted steam generator will be less than the maximum pressure differential associated with a postulated MSLB assumed to occur at the end of the next operating cycle. The second portion of this evaluation is the calculation of the total leak rate from the affected steam generator during a postulated MSLB occurring at the end of the next operating cycle. This leak rate calculation is intended to ensure that the total leak rate would be less than a rate that could lead to radiological releases in excess of the licensing basis for the plant.

The methodology used by FTI to perform these calculations involves a monte carlo sampling process. This process uses the BOC7 voltage distribution discussed in Section 4.4 and the bounding growth distribution discussed in Section 4.5. This process accounts for voltage growth due to defect progression, NDE uncertainties, and the uncertainties associated with the burst pressure and leak rate correlations. This methodology is documented in Reference 7.1 and has been approved by the NRC (Reference 7.6).

5.1 Conditional Probability of Burst

The conditional probability of burst was calculated for each steam generator using the FTI program STDPOB.EXE. The inputs used in the program include the BOC voltage distributions (Tables 4-1 through 4-4), the bounding growth distribution (Table 4-6), and the burst pressure versus voltage correlation parameters (Equation 2-1). As noted in Section 4.5, some of the steam generators had less than 200 indications for use in the growth distributions. Therefore, a growth distribution was developed which bounded the growth of all of the steam generators. This bounding growth distribution was then applied to each steam generator in lieu of using generator-specific distributions.

The results of the POB calculations are shown in Table 5-1. The highest probability of burst was 8.33×10^{-5} in S/G C. This is well below the 1.0×10^{-2} threshold specified in the Generic Letter.

Table 5-1
Conditional Probability of Burst Results

Steam Generator	95% Upper Confidence Limit for Probability of Burst
A	3.73×10^{-5}
B	3.26×10^{-5}
C	8.33×10^{-5}
D	7.84×10^{-5}

5.2 MSLB Leakage

The accident leak rate due to ODSCC at the tube support plates was calculated for each steam generator using the FTI program STDLKR95.EXE. The parameters for the probability of leakage and leak rate versus voltage correlations which were used in the program are shown in Equations 2-2 and 2-3.

An F* Alternate Repair Criterion for tubesheet indications was also implemented during the 1RE06 inspection. The leak rate for the tubes which were left in service under the F* criterion must be added to the leak rate due to ODSCC at the tube support plates to obtain the total leak rate. The leak rate for F* tubes was determined to be 2.31×10^{-6} gallons per minute per tube and is documented in Reference 7.3. The F* criterion, however, was only applied to one tube during 1RE06 (Reference 7.4). Therefore the leak rate due to F* tubes at STP-1 is 2.31×10^{-6} gallons per minute in S/G D and 0 gallons per minute in the other steam generators.

Table 5-2 shows the results of the leak rate calculations as well as the combined ODSCC and F* leakage. As shown, the largest calculated total leak rate is 0.00752 gallons per minute in S/G C. This is well below the acceptable limit of 5.15 gallons per minute for the maximum primary-to-secondary leakage initiated by a main steam line break accident as defined in the Safety Evaluation Report for South Texas Plant Amendment 83.

Table 5-2
Leak Rate Calculation Results

Steam Generator	95%/95% Upper Tolerance Limit for Leak Rate (gpm)	Leak Rate for F* Tubes (gpm)	Total Leak Rate (TSP & F*)
A	0.00213	0	0.00213
B	0.00173	0	0.00173
C	0.00752	0	0.00752
D	0.00685	2.31×10^{-6}	0.00685

6.0 Summary and Conclusions

The May 1996 inspection at STP-1 revealed a total of 1023 distorted support indications. As expected, most of these indications were at the lower support plates on the hot leg side. No indications were detected at cold leg supports or at the flow distribution baffle plates. With 442 DSI's, S/G C had the largest population of indications, but it also had the lowest average growth rate at 4.5%.

There were no indications detected which were greater than the upper repair limit of 2.85 volts and only six indications detected which were greater than the lower repair limit of 1.0 volt. These indications were inspected with RPC, but only one of the indications was confirmed. This indication was confirmed as a volumetric indication and the tube was subsequently plugged as required by the Generic Letter. There were no crack-like indications detected at support plates.

RPC was performed on several other support locations, mostly due to dents greater than 5.0 volts at the supports. None of these locations were confirmed as having ODSCC. Two tubes, however, had dented support plate locations in the cold leg which could not be inspected with RPC due to the fact that the dents would not allow passage of the RPC probe. Both of these tubes were plugged.

The average growth rate for all steam generators combined was determined to be 13.1% per EFPY. This growth rate represents the voltage growth between 1RE05 and 1RE06 as compared to the BOC6 voltage and is well below the 30% per EFPY criterion specified in the Generic Letter. Therefore, the 30% per EFPY growth rate will be used when determining the upper repair limit prior to the next inspection.

The tube integrity evaluation shows that the projected probabilities of burst and leak rates are well below the allowable limits. S/G C was determined to be the limiting steam generator. The 95% upper confidence limit for the probability of burst for S/G C under main steam line break conditions at EOC7 was calculated to be 8.33×10^{-5}. This is well below the threshold of 1.0×10^{-2} specified in the Generic Letter. The 95%/95% upper tolerance limit for the leak rate for S/G C under accident conditions was calculated to be 0.00752 gallons per minute. This is well below the acceptable limit of 5.15 gallons per minute as defined in the Safety Evaluation Report for South Texas Plant Amendment 83. Based on these results, the effect of ODSCC at tube support plates on tube integrity is not a major concern for Cycle 7 at South Texas Unit 1.

7.0 References

7.1 FTI Document BAW-10204P, "South Texas Project Unit 1 Tube Repair Criteria For ODSCC At Tube Support Plates".

7.2 FTI Document 51-1245645, "EPRI Leak Rate And Burst Pressure Database For 3/4" Tubing Voltage Based Repair Criteria".

7.3 FTI Document BAW-10203P, "W E-Series F* Qualification Report".

7.4 FTI Document 51-1245633, "South Texas Project - F* Application At STP-1 1RE06".

7.5 NRC Generic Letter 95-05, "Voltage-Based Repair Criteria For Westinghouse Steam Generator Tubes Affected By Outside Diameter Stress Corrosion Cracking".

7.6 NRC Letter, "Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 83; Facility Operating License No. NPF-76; Houston Lighting & Power Company; City Public Service Board of San Antonio; Central Power and Light Company; City of Austin, Texas; Docket No. 50-498; South Texas Project Unit 1", May 1996.