CYCLE 5, STARTUP PHYSICS TEST REPORT

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Enclosure to IPN-86-02
Cycle 5 Startup Physics Test Report

New York Power Authority
Indian Point 3 Nuclear Power Plant
Docket No. 50-286

TABLE OF CONTENTS

	Page No.
1.0 INTRODUCTION	1-1
1.1 Plant Description	1-1
1.2 Test Objectives	1-2
1.3 Relevant Design Information	1-2
1.4 Sequence of Startup Events	1-2
1.5 Summary of Measured and Predicted Core Parameters	1-2
2.0 MEASUREMENT TECHNIQUES	2-1
2.1 General	2-1
2.2 Reactivity Measurements	2-1
2.2.1 Subcritical Measurements	2-1
2.2.2 Critical Measurements	2-2
2.3 Power Distribution Measurements	2-3
2.4 Instrumentation Calibration Data Collection	2-4
2.5 Thermal Power Measurements	2-4
3.0 TEST RESULTS - REACTIVITY MEASUREMENTS	3-1
3.1 Core Loading	3-1
3.2 Initial Criticality	3-1
3.3 Low Power Physics Tests	3-1
3.3.1 Preliminary Measurements	3-1
3.3.2 Boron Endpoints	3-3
3.3.3 Temperature Coefficient	3-3
3.3.4 RCC Bank Worths	3-3
3.4 At Power Tests	3-3
3.4.1 Power Coefficient Measurement	3-3
3.5 Movable Detector Flux Maps	3-4
4.0 INSTRUMENT MEASUREMENTS/CALIBRATIONS	4-1
4.1 Incore Thermocouple, Wide Range and Narrow Range RTD Meas.	4-1
4.2 Incore - Excore Calibration	4-1

APPENDIX A	Measurement of the Power Coefficient	A-1
APPENDIX B	Core Loading Sequence	B-1
APPENDIX C	Generation of Withdrawal Limits to Insure a Negative Moderator Coefficient	C-1

LIST OF TABLES

Table	Title	Page No.
1.1	Core Design Information Parameters	1-3
1.2	Summary of Measured and Predicted Parameters	1-4
3.1	Reactivity Computer Checkout Results	3-2
3.2	Flux Map Summary, Hot Zero Power - All Rods Out	3-4
3.3	Flux Map Summary, Hot Full Power - All Rods Out	3-5
4.1	Results of Narrow Range RTD Measurement	4-2
4.2	Incore-Excore Calibration	4-3
A-1	Results of Data Analysis	A-3
C-1	Summary of Withdrawal Limit Calculations	C-3

LIST OF FIGURES

FIGURES	TITLE	PAGE NO.
1.1	Core Layout	1-6
1.2	Control Rod Locations	1-7
3.1	ICRR During Core Loading SR-31	3-6
3.2	ICRR During Core Loading SR-32	3-7
3.3	ICRR vs Bank Position	3-8
3.4	ICRR vs Gal. Dilution Water Added	3-9
3.5	Control Bank D Differential and Integral Worth	3-10
3.6	Control Bank C Differential and Integral Worth	3-11
3.7	Control Bank B Differential and Integral Worth	3-12
3.8	Control Bank A Differential and Integral Worth	3-13
3.9	Measured and Expected FDHN - HZP	3-14
3.10	Measured and Percent Diff. of FDHN - HZP	3-15
3.11	Measured and Expected FDHN-HFP	3-16
3.12	Measured and Percent Diff. of FDHN-HFP	3-17
A-1	Data Reduction Flow Chart	A-5
C-1	Boron Concentration vs Rod Position to ensure a Negative MTC	C-4

1.0 INTRODUCTION

1.1 PLANT DESCRIPTION

The Indian Point Unit 3 Nuclear Plant is a four loop closed cycle pressurized light water moderated and cooled nuclear reactor operated by the New York Power Authority. The reactor core is designed to produce 3025 megawatts thermal power resulting in a net electrical generating capacity of 965 megawatts of electrical energy.

The Nuclear Steam Supply System was designed by Westinghouse Electric Corporation.

The plant is located on the east side of the Hudson River, approximately 30 miles north of New York City.

1.2 TEST OBJECTIVES

This report documents the results of physics tests performed as part of the cycle 5 startup testing program:

The objectives of the physics tests were: (1) to verify that the operating characteristics of the core are consistent with design predictions, (2) to demonstrate that measured core parameters are consistent with values used in the Safety Analyses, (3) to demonstrate that the core can be operated at licensed thermal power safely and within the limits of the Technical Specifications, and (4) to provide data for nuclear instrumentation calibration.

1.3 RELEVANT DESIGN INFORMATION

Table 1.1 presents selected design information of the Indian Point 3 Nuclear Plant. Figure 1.1 shows the core layout with control rods, sources, and enrichment locations. Figure 1.2 shows the core layout with individual central and shutdown bank locations. The Cycle 5 core is a mixed core, containing both Westinghouse low parasitic LOPAR fuel (Regions 5,6-1 and 6-2) and Westinghouse Optimized Fuel Assemblies (Regions 7-1 and 7-2). The OFA fuel differs from the LOPAR fuel in that the five central grids are wider and made of Zircaloy - 4 rather than Inconel - 718, and that the insert guide thimbles are slightly narrower. The core also contains 60 Wet Annular Burnable Absorber (WABA) assemblies to provide power shaping, reduction of peak power and Moderator Temperature Coefficient (MTC) control.

1.4 SEQUENCE OF STARTUP EVENTS

Following core loading, August 11- August 19, 1985, a series of pre-operational tests was performed both in the cold shutdown and hot shutdown conditions. Criticality was achieved on October 2, 1985 followed by a program of low power physics tests. The unit was synchronized to the grid on October 4, 1985. Power escalation included stopping at approximately 10% power level increments above 50% for purposes of data collection and testing. Maximum power (100%) was achieved on November 3, 1985. Cycle 5 startup physics testing was officially completed on November 7, 1985 with the completion of the full power flux map.

1.5 SUMMARY OF MEASURED AND PREDICTED CORE PARAMETERS

Presented in Table 1.2 is a summary of selected results of zero power physics tests and at-power distribution measurements. The results reported in this document indicate that all acceptance criteria specified in the cycle 5 reload submittal were met.

TABLE 1.1

Core Design Information Parameters

Number of Fuel Assemblies	193
Region 5	41
Region 6-1	36
Region 6-2	40
Region 7-1	36
Region 7-2	40
Lattice Configuration	15X15
Number of fuel rods per assembly	204
Fuel loading, MTU	88.48
Number of Assemblies Containing RCC Full Length	53
Number of Absorber Rods per RCC Assembly	20
Number of Control Rod Assembly Guide Thimbles per Assembly	20
Number of Instrumentation Thimbles per Assembly	1
Number of Grids in Active Core Height	7
Heat Output, MWth	3025
Percent Heat Generated in Fuel	99.5
Hot Zero Power Coolant Temperature, °F	547.0
Operating Pressure, psia	2250
Maximum Hot Channel Factors (Design)	
Heat Flux F_QT	2.13
Nuclear Enthalpy Rise, $F_{\Delta H}$	1.55
Average Linear Power Density, kw/ft Fuel	6.24
Specific Power, kw/kg Uranium	34.19
Enrichments, w/o Uranium 235	
Region 5	3.30
Region 6-1	3.20
Region 6-2	3.40
Region 7-1	3.20
Region 7-2	3.40

TABLE 1.2

Summary of Measured and Predicted Parameters

1. Reactivity Measurements

1.1 HZP Critical Boron Conc. (ppm)
(Acceptance Criteria: ± 50 ppm)

Rod Position	Measured	Predicted	M-P
ARO	1496 ppm	1500 ppm	- 4
D IN	1402	1380	22
D+C IN	1306.7	1301	5.7
D+C+B IN	1234	1225	9
ARI	1115	1092	23

1.2 Isothermal Temperature Coefficient (pcm/°F)
(Acceptance Criteria: ± 3 pcm/°F)

				Inferred MTC* (pcm/°F)
ARO	-1.401	-1.30	-0.101	+ 0.629
D IN	-2.79	-2.43	-0.36	- 0.76
D+C IN	-4.85	-4.72	-0.13	-2.73

1.3 RCC/RCCA Worth Measurements (pcm)
(Acceptance Criteria: ± 15% for individual banks, ±10% for total)

			(M/P) Ratio
D	1064.5 pcm	1043 pcm	1.0206
C(D IN)	718	699	1.0272
B(D+C IN)	633	667	0.9490
A(D+C+B IN)	1205.3	1186	1.0163
Total	3620.8	3595	1.0072

1.4 Differential Measured Power Coeff. -12.113 pcm/%
Predicted Power Coeff. -10.6 pcm/%
(Acceptance Criteria: ± 2 pcm/%)

1.5 Average differential boron worth
(Acceptance Criteria: ±15%)

- 9.42 pcm/ppm -8.79 pcm/ppm

2. Power Distribution

Hot Zero Power (ARO)	Technical Specification Limit	Measured** Value
$F^N_{\Delta H}$	2.0150	1.6276
F^T_Q	4.2600	2.6379

* Assumes -2.03 pcm/°F for doppler temperature coefficient

TABLE 1.2 - Continued

Hot Full Power (ARO)

$F^N_{\Delta H}$	1.5555	1.5529
F^T_Q	2.1554	1.8889

** Includes Engineering and Nuclear Uncertainty

FIGURE 1.1

CORE LAYOUT

0°

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	
					215 R06	59Z T18	55Z T62	184 S64	15Z T49	53Z T06	223 R71					15
			145 R54	182 S60	4P 5WZ T72	R86 S28	16P 15WZ T76	R72 S30	16P 10WZ T46	R87 S13	4P 7WZ T50	211 S69	149 R64			14
		135 R13	R69 S63	12P 25WZ T52	R62 S23	16P 24WZ T67	R105 S17	SPS-13 S76	R111 S18	16P 23WZ T37	R79 S36	12P 9WZ T56	R104 S48	137 R01		13
		168 S44	12P 22WZ T55	R95 S45	SS 15 S75	195 R33	12P 1WZ T28	R100 S26	12P 14WZ T13	244 R48	186 S38	R74 S46	12P 10WZ T73	207 S74		12
	246 R47	4P 2WZ T40	R113 S20	9 S52	190 S07	12P 18WZ T27	254 R57	12P 27WZ T08	R89 R36	12P 6WZ T19	159 S24	232 S56	R80 S05	4P4 WZ T54	203 R32	11
	2Z T04	R81 S35	16P 18WZ T69	238 R68	12P 5WZ T26	R78 R65	16P 2WZ T22	R71 R52	16P 3WZ T01	R61 R58	12P 3WZ T25	189 R02	16P 12WZ T44	R64 S11	1Z T03	10
	8Z T42	16P 1WZ T74	R112 S29	12P 26WZ T31	R76 R23	16P 5WZ T07	243 S54	183 S68	173 S58	16P 11WZ T20	134 R16	12P 4WZ T14	R77 S02	16P 20WZ T64	7 Z T39	9
270°	13 S50	R99 S03	251 S72	R88 S12	12P 17WZ T15	R73 R10	162 S51	R94 R03	170 S42	R70 R66	12P 21WZ T02	R91 S06	7 S53	R82 S34	187 S43	8
	57Z T48	16P 14WZ T41	R102 S15	12P 7WZ T35	11 R09	16P 16WZ T32	222 S49	181 S62	152 S47	16P 8WZ T16	R66 R08	12P 12WZ T24	R75 S25	16P 21WZ T65	35Z T51	7
	58Z T34	R103 S04	16P 22WZ T71	221 R62	12P 13WZ T29	R90 R31	16P 17WZ T36	R109 R70	16P 9WZ T23	R84 R56	12P 23WZ T33	10 R51	16P 13WZ T59	R67 S14	63Z T11	6
	236 R17	4P 6WZ T47	R83 S19	132 S66	8 S31	12P 8WZ T05	R68 R04	12P 20WZ T30	151 R21	12P 24WZ T17	240 S16	197 S57	R65 S32	4P8 WZ T38	224 R53	5
		153 S65	12P 16WZ T75	R107 S61	192 S40	161 R05	12P 2WZ T21	R92 S33	12P 28WZ T09	140 R24	SS14 S73	R85 S37	12P 15WZ T60	233 S71		4
		155 R26	R97 S39	12P 19WZ T66	R93 S01	16P 19WZ T45	R63 S10	SS11 S70	R110 S27	16P 6WZ T63	R106 S22	12P 11WZ T57	R101 S67	166 R61		3
			6 R27	245 S59	4P 3WZ T43	R98 S21	16P 7WZ T61	R108 S08	16P 4WZ T70	R96 S09	4P 1WZ T53	169 S55	218 R72			2
					217 R43	62Z T12	5Z T58	141 S41	9Z T68	51Z T10	206 R25					1

180°

ASSEMBLY ENRICHMENTS

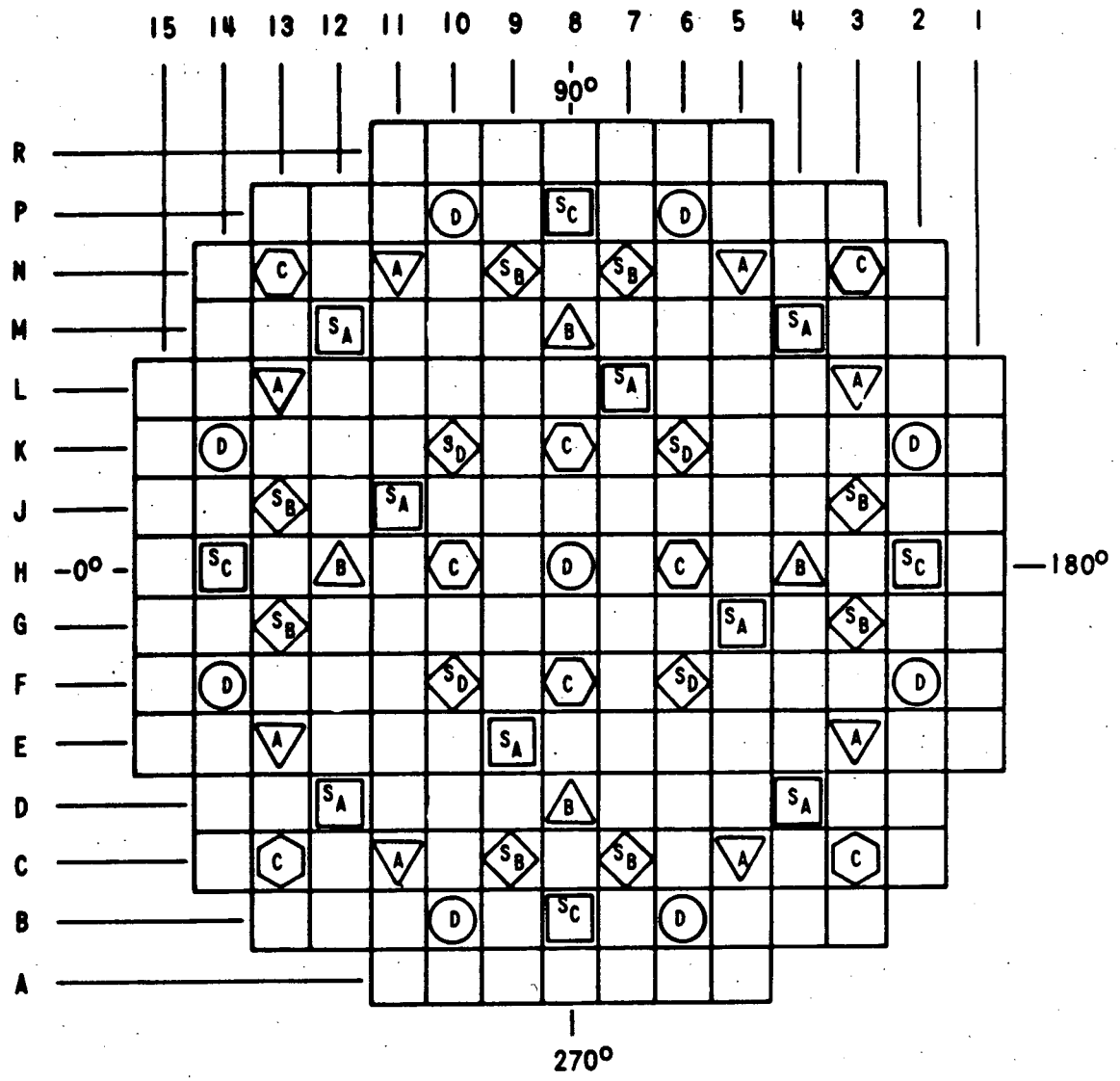
RXX - 3.30 w/o U-235
SXX - 3.20 or 3.40
TXX - 3.20 or 3.40

Fuel Assembly No.
Insert No.
1-6

INSERT KEY

RXXX - Control Rod Assembly
SSXX - Secondary Source
SPSXX- Secondary Source
XXXZ - Plugging Device
XXX - Plugging Device
XXP } - Burnable Poison
XXWZ }

FIGURE 1.2



BANK	SYMBOL	NUMBER OF ROD CLUSTERS
S_A	□	8
S_B	◇	8
S_C	□	4
S_D	◇	4
A	▽	8
B	△	4
C	⬡	8
D	○	9

CONTROL AND SHUTDOWN ROD LOCATIONS

2.0 MEASUREMENT TECHNIQUES

2.1 GENERAL

The methods for physics test data acquisition can be grouped into four distinct areas: (1) reactivity measurements, (2) measurements of core power distribution (3) collection of instrumentation data, and (4) thermal power measurements. The purpose of this section is to describe the methods used in each of these areas.

2.2 REACTIVITY MEASUREMENTS

Measurements of core reactivity were performed both in subcritical and critical core conditions. In the subcritical mode, measurements were made during initial core loading and the approach to criticality. In the critical mode, measurements were made to determine core kinetics parameters.

2.2.1 Subcritical Measurements

During core loading, the core reactivity was monitored using the response of the two plant source range channels. Monitoring was accomplished by observing the normalized inverse count rate ratio (ICRR) for each channel as the core was loaded. During the approach to criticality, ICRR plots using data from the two plant source range channels were used to predict expected criticality. ICRR data were plotted as a function of rod position during rod withdrawal, and as a function of measured boron concentration during dilution.

2.2.2 Critical Measurements

Small core reactivity changes were determined with the aid of an analog (reactivity) computer which provided an on-line solution to the point kinetics equations. Reactivity records were maintained on a continuous basis during a test via a strip chart recorder which logged the output from the reactivity computer.

The input signal to the reactivity computer was provided by the Nuclear Instrumentation System (NIS) power range channels. During zero power measurements, one NIS power range channel was taken out of plant service and used as input to the reactivity computer. Signals from the top and bottom section were summed, and the common signal was converted to voltage by a picoammeter for input to the reactivity computer.

Differential and integral worth of individual rod control cluster assemblies (RCCA's) or rod control clusters (RCC) were obtained from the reactivity computer response to stepwise movement of the control element. During the measurement, the reactor was maintained, on the average, in the critical state.

Isothermal temperature coefficient data were obtained by measuring the reactivity computer response to small temperature changes, a few degrees below design no load temperature.

Just critical boron concentration data were obtained from plant chemistry boron analyses of reactor coolant system samples (RCS) under equilibrium conditions. For boron concentration endpoints, corrections to the measured concentration utilized reactivity computer measurements of the reactivity difference between actual and design core configurations.

Power coefficient data were obtained by measuring the change in T-avg resultant from a change in core power level. Under conditions of constant RCS boron concentration, the core power level was decreased and increased incrementally approximately 2% by changing turbine loading. Changes in T-avg and ΔT were measured using a two pen stripchart recorder. Changes in core power level were determined from secondary side calorimetric measurements and changes in ΔT.

2.3 POWER DISTRIBUTIONS

The Moveable Detector (M/D) Flux Mapping System was used to collect power distribution data. The power distribution measurements were performed throughout the startup program with standard control bank positions to verify correct fuel loading patterns and design calculations; and to provide calibration data for the correlation of excore detector response. Data from the M/D system was input to the INCORE computer code to generate detailed three dimensional core power profiles. The INCORE code combines measured flux distributions with design calculated power flux distribution to yield specific fuel rod powers, local burnup, core power tilts, core average axial offset, etc.

2.4 INSTRUMENTATION CALIBRATION DATA COLLECTION

At each stable power level (statepoint) during the power escalation program (approximately each 10% at and above 50%) measurements were made of RCS loop temperatures (Tavg and ΔT), Steam Generator pressure and NIS power range detector currents. NIS currents were read from the power range current meters. Temperature and pressure data were obtained from the meters on the control board and from the plant computer.

Core exit thermocouple and RTD data were obtained during isothermal measurements prior to criticality.

Correlations between incore axial power distribution and excore power range detector response were made through simultaneous measurement of core power level, excore detector currents and core power distributions (flux maps).

2.5 THERMAL POWER MEASUREMENTS

Core thermal power was determined by performing a heat balance across each of the steam generators. This measurement required the accurate determination of steam generator pressure, feedwater inlet temperature, and feedwater flow. For each steam generator steam pressure was taken as the average of the three channel Plant Computer readings; feedwater temperature was taken from the resistance temperature detector (RTD) located in the feedwater header and feedwater flow was determined from the Leading Edge Flow Meters.

3.0 TEST RESULTS - REACTIVITY MEASUREMENTS

3.1 CORE LOADING

Core loading was accomplished by adding fuel assemblies to the vessel following the prescribed sequence shown in Appendix B. ICRR data obtained from the NIS source range channels are presented in Figures 3.1 through 3.2. There were no unexpected changes in core reactivity during the loading of the fuel assemblies.

3.2 INITIAL CRITICALITY

The approach to criticality began on October 1, 1985 at 1930 hours with the incremental withdrawal of shutdown and control banks. Primary System boron concentration during rod withdrawal was approximately 1750 ppm. Inverse count rate ratio data from the two source range channels during rod withdrawal are shown in Figure 3.3. Criticality was achieved with the addition of reactor makeup water. Inverse count ratios during boron dilution are shown in Figure 3.4. Throughout the critical approach, count rates from the two source range channels were both adequate and consistent for good monitoring of core reactivity. Count rates at the beginning of rod withdrawal were 461.3 and 249.2 cps for N31 and N32 respectively.

3.3 LOW POWER PHYSICS TESTS

3.3.1 Preliminary Measurements

Immediately following criticality, the upper limit of flux level for zero power testing was established as about one decade below which detectable nuclear heat was added to the coolant.

All reactivity measurements were performed below 6.8×10^{-8} amps on intermediate range channel N-35. This testing was also well above the gamma background level of 1.0×10^{-8} amps on N-35.

Next a check of the reactivity computer performance was made by measuring three values of reactivity and comparing the value with that inferred from the resultant reactor period from parameters given in the core design report. The results of this test, given in Table 3.1, indicate proper operation of the reactivity computer.

TABLE 3.1

REACTIVITY COMPUTER CHECKOUT RESULTS

Period (sec)	Inferred Reactivity (pcm)	Measured Reactivity (pcm)	Difference (Meas.- Inferred) (pcm)
50.36	91.05	90.83	-0.22
100.36	54.94	54.73	-0.21
200.63	31.02	30.82	-0.20
401.57	16.52	16.52	-0

3.3.2 Boron Endpoints

The just critical boron concentration was measured for three rod configurations. The test results were summarized in Table 1.2 along with design predictions.

3.3.3 Temperature Coefficient

Isothermal temperature coefficient measurements were performed at three core conditions as summarized in Table 1.2. The all-rods-out moderator-only temperature coefficient (MTC) is slightly positive, thereby requiring rod withdrawal limits to insure a negative MTC as required by Technical Specifications. This calculation is presented in Appendix C.

3.3.4 RCC Bank Worths

Bank worth measurements were performed over the four individual control banks (in non-overlap mode). Measured and predicted integral worths of these four banks are summarized in Table 1.2. Also the differential and integral worth of each bank is shown as a function of bank position in Figures 3.5, 3.6, 3.7 and 3.8.

3.4 At Power Tests

3.4.1 Power Coefficient Measurement

See Appendix A.

3.5 Movable Detector Flux Maps

One movable detector flux map was taken at low power (<1%) in the all-rods-out configuration. The results of this map are shown in Figure 3.9 and 3.10 with the measured $F^N_{\Delta H}$ compared to predicted $F^N_{\Delta H}$ for each assembly. All values are within the acceptance criteria of ± 15%. The high tilt of 1.0339 in the Southeast Quadrant does not present a problem since this map was taken at extremely low power. Flux tilt was carefully monitored for all subsequent maps for the remainder of the physics testing program, and no tilts above the Technical Specification limit of 1.02 were observed.

Flux map results are summarized below.

TABLE 3.2

FLUX MAP SUMMARY

HOT ZERO POWER - ALL RODS OUT

Tilts (Upper)			(Lower)			
	0.9840	1.0339		.9938	1.0258	←
	0.9725	1.0096		.9710	1.0093	N

Core Avg. Axial Offset: +32.432%

Peak $F^N_{\Delta H}$: 1.6276 at location J14 IH

Most limiting F^N_Q : 2.6379 at location G2 GH,

A second full core flux map was taken at full power (98.8%) in the all-rods-out configuration. The results of this map is shown on Figures 3.11 and 3.12. All values are within the acceptance criteria of ±15%.

Additional flux map results are summarized below:

Table 3.3

Flux Map Summary

Hot Full Power - All Rods Out

N ←

Tilts: (Upper)	1.0057	1.0119	(Lower)	.9942	1.0159
	.9862	.9962		.9852	1.0046

Core average axial offset: 4.244%

Peak $F^N_{\Delta H}$: 1.5529 at location N8 FD

Most limiting F_Q : 1.8889 at location N8 FD

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20 X 20 PER INCH

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N-31 $\frac{1}{M}$ 08/11/85 TO 08/19/85 FP-INT-R4 Rev 0

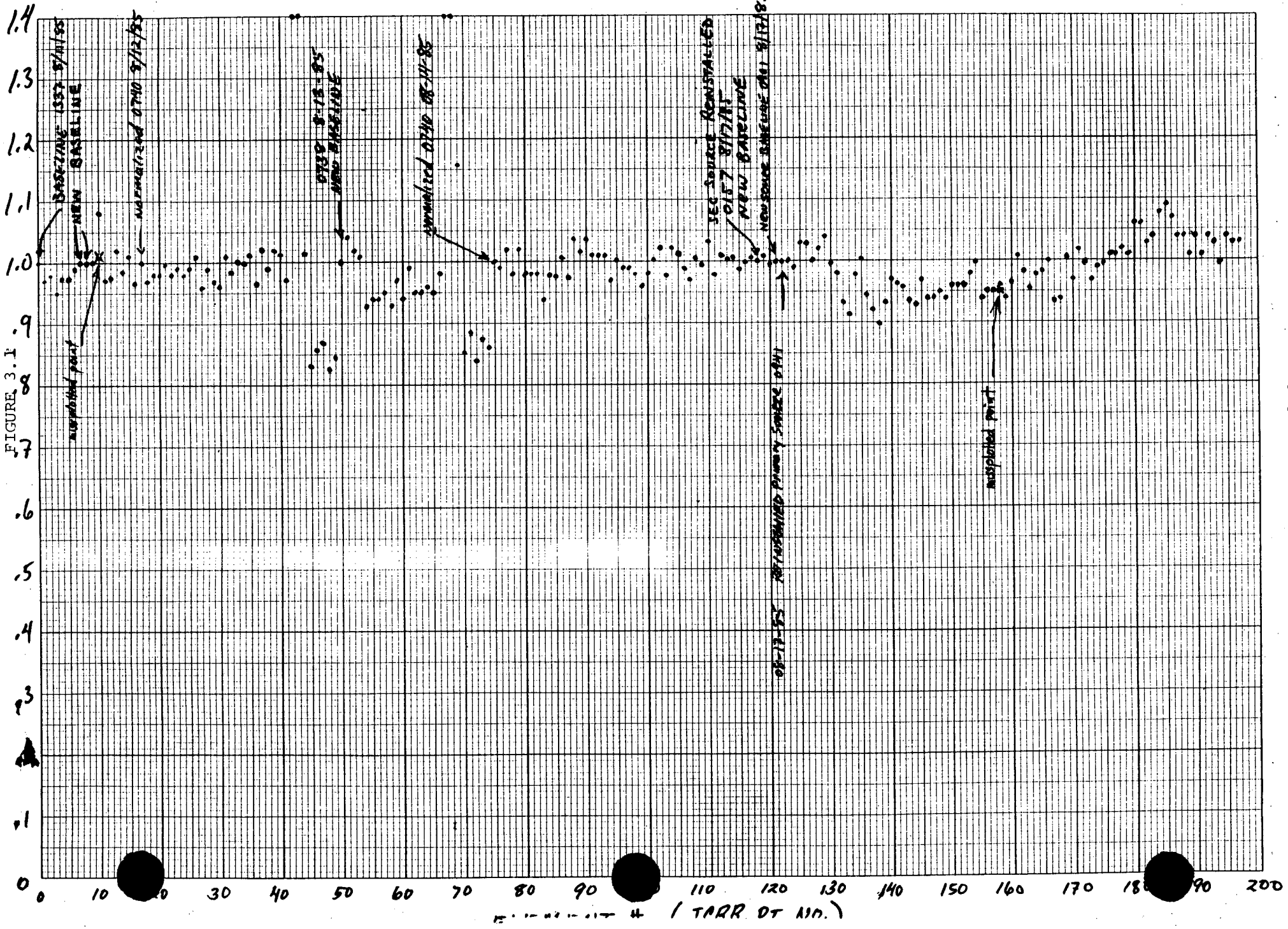


FIGURE 3.1

NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

DIETZGEN CORPORATION
MADE IN U.S.A.

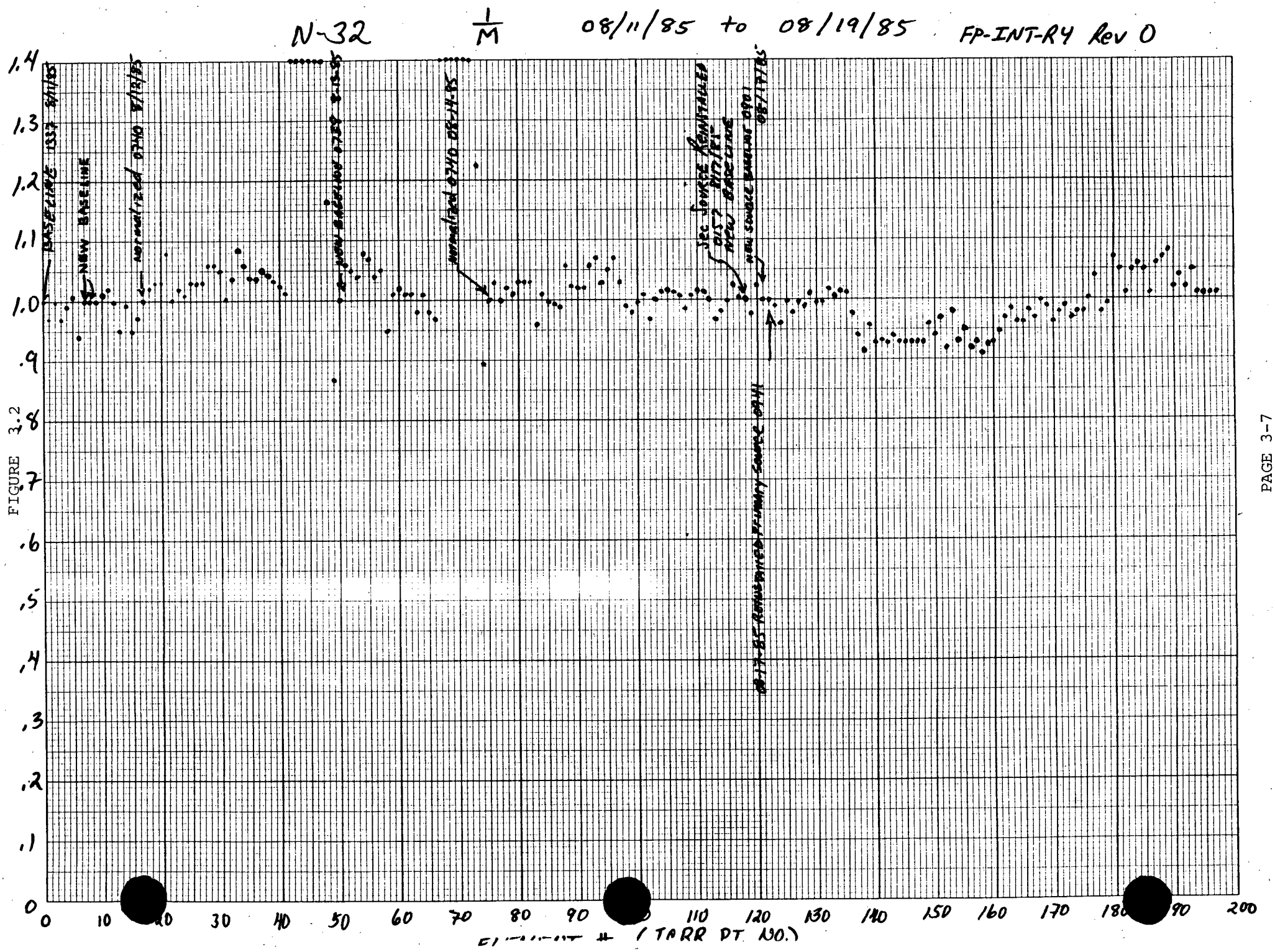


FIGURE 3.2

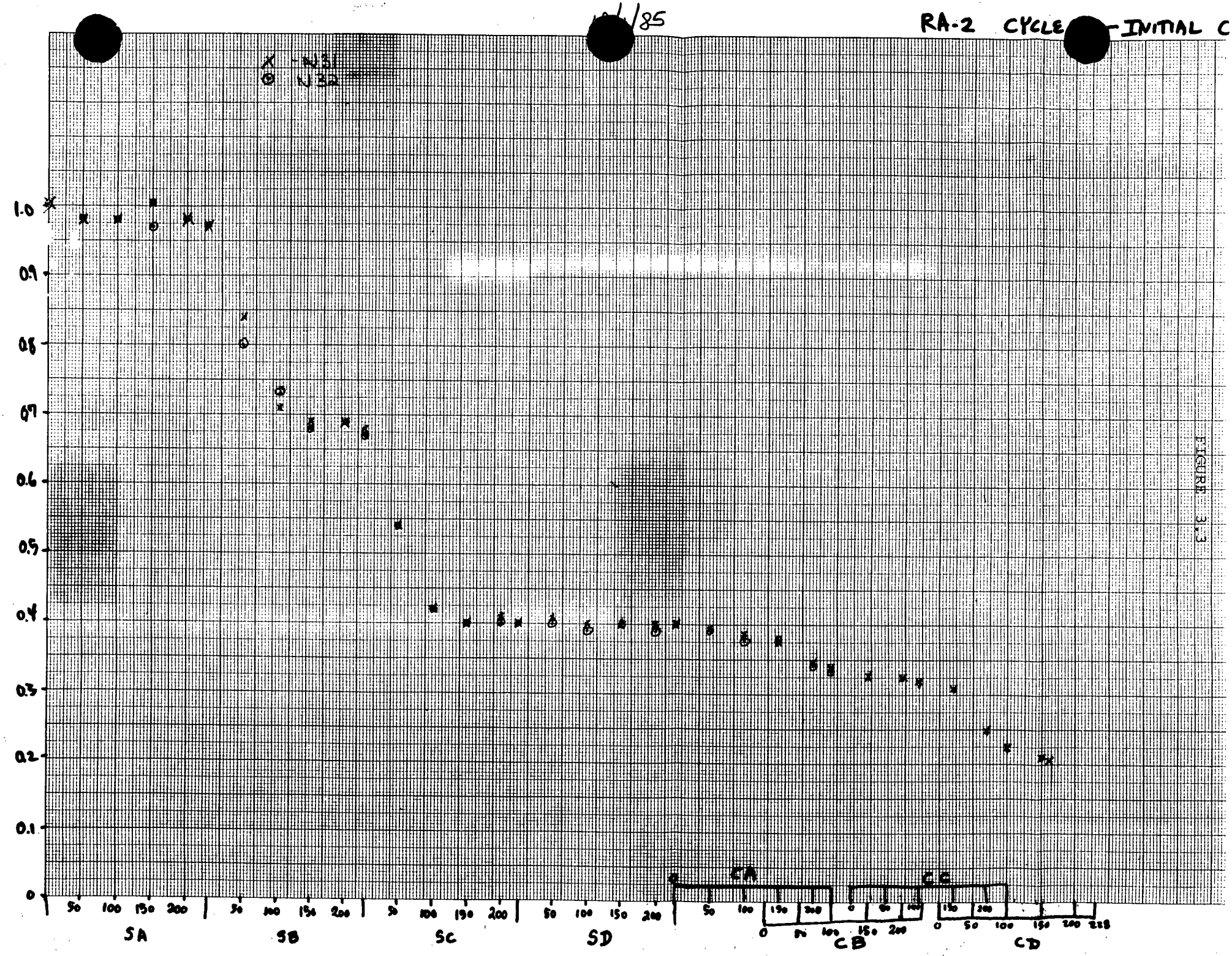


FIGURE 3-3

K+E 10 X 10 TO THE CENTIMETER 25 X 38 CM. KEUFFEL & ESSER CO. MADE IN U.S.A. 47 1510

R.A.-2 CYCLE 5 IN[illegible]L CRITICAL

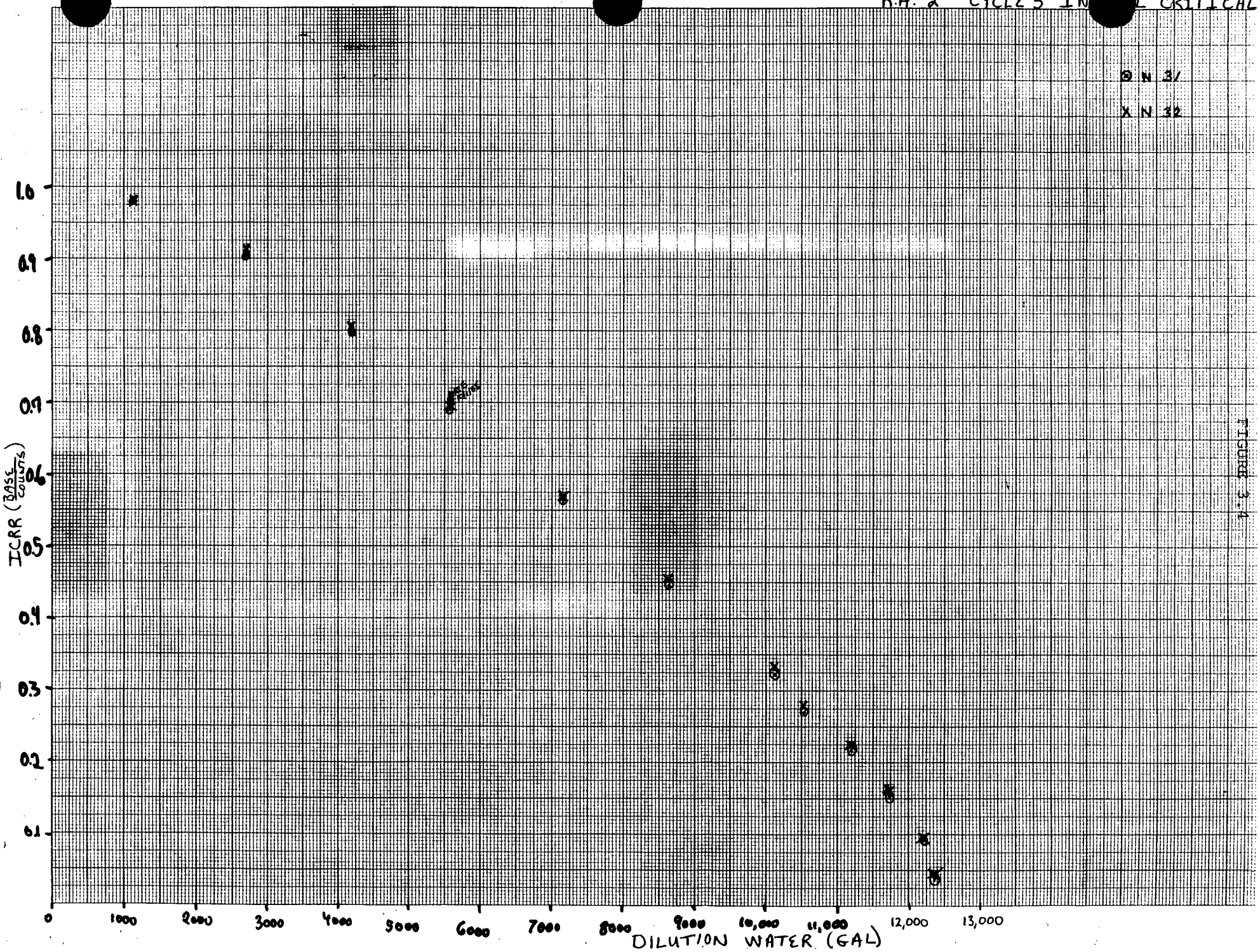
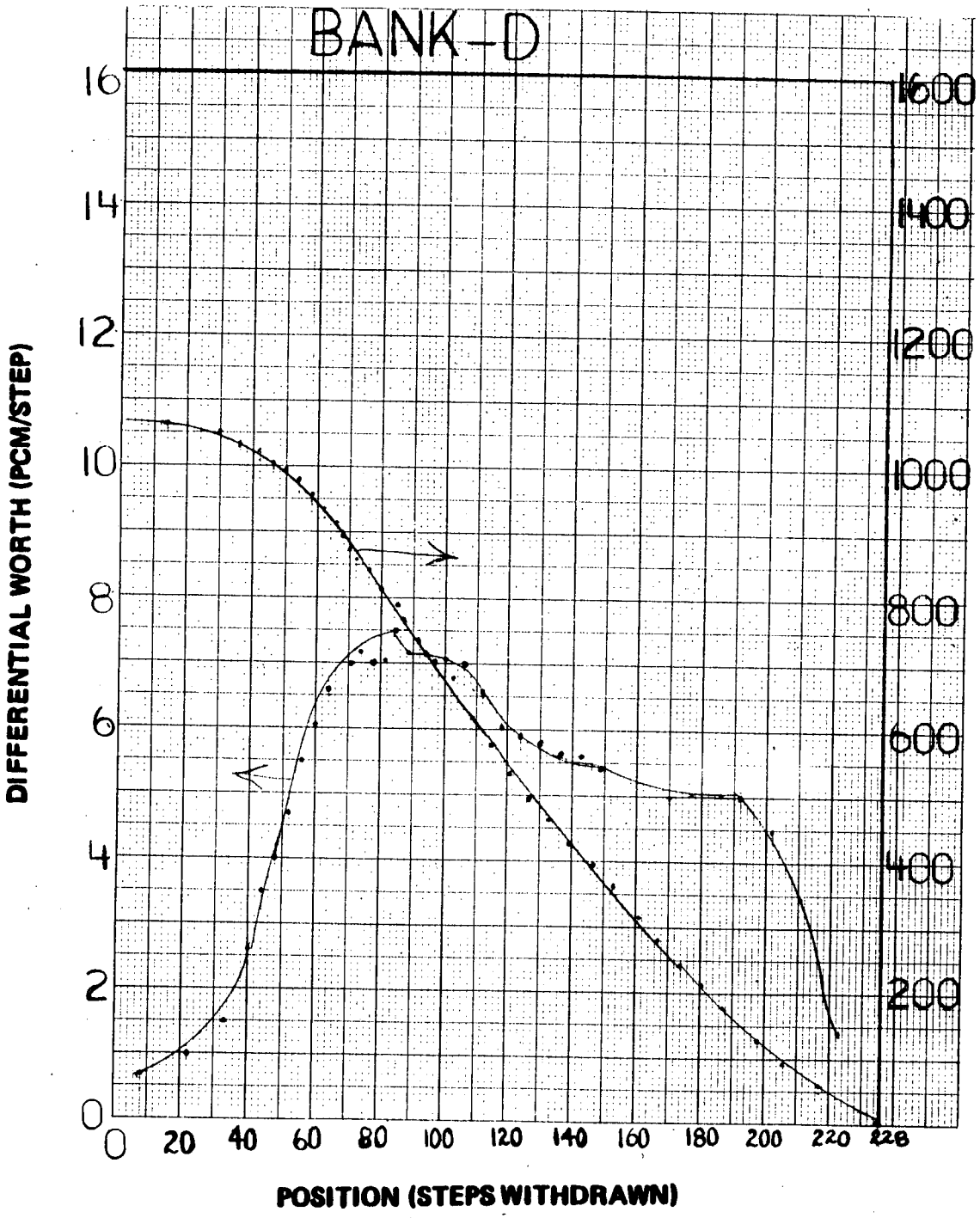


FIGURE 3.4

K+E 10 X 10 TO THE CENTIMETER • 25 X 38 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.
47 1510



PLANT: IP-3, Cy 5

TEST: RA-4

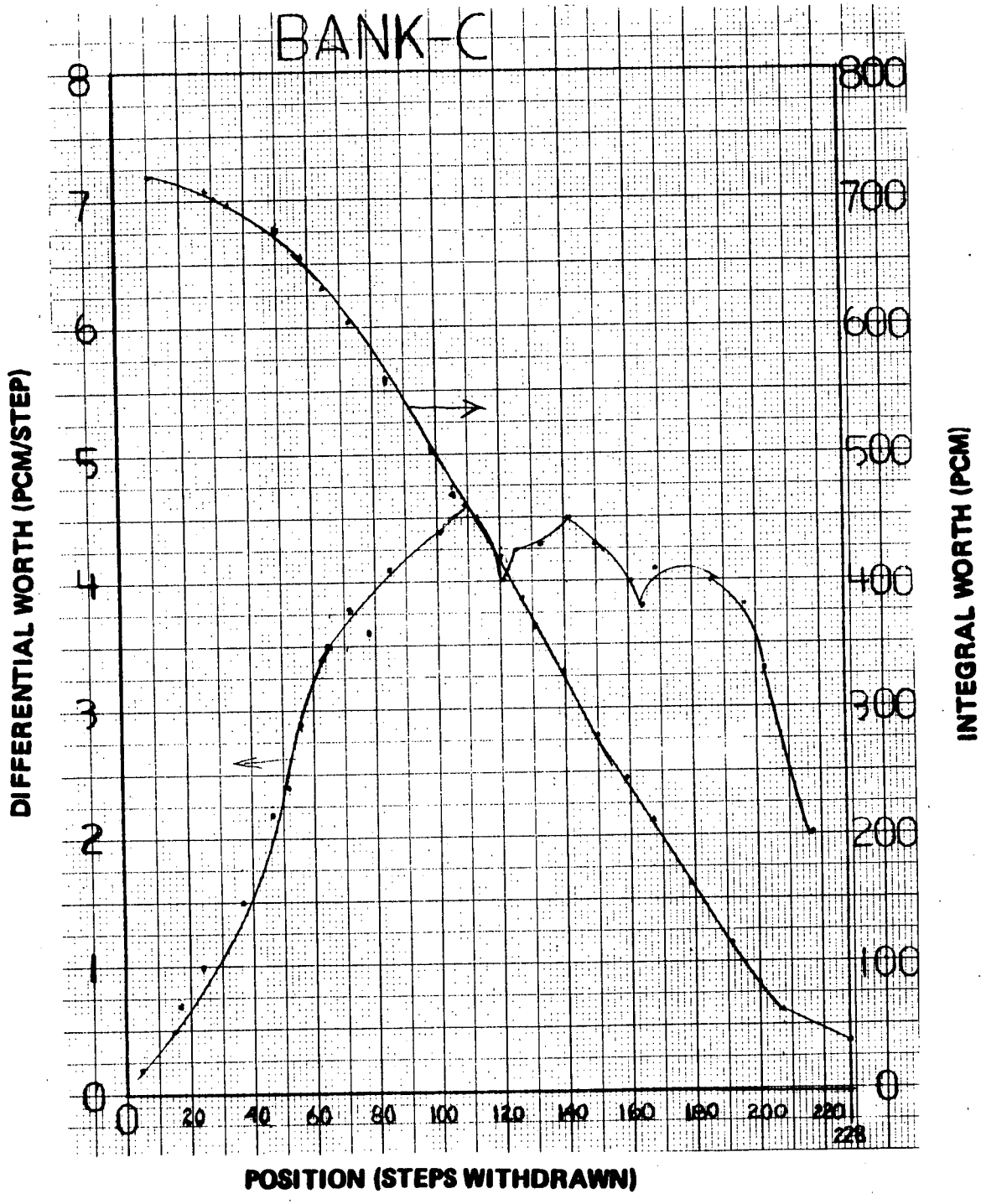
DATE: 10/2/85

TEST CONDITIONS:

RCC BANK POSITIONS:

SDA	228
SDB	228
SDC	228
SDD	228
SDE	N/A
CA	228
CB	228
CC	228
CD	Moving

FIGURE 3.5



PLANT: IP-3, Cy 5

TEST: RA-4

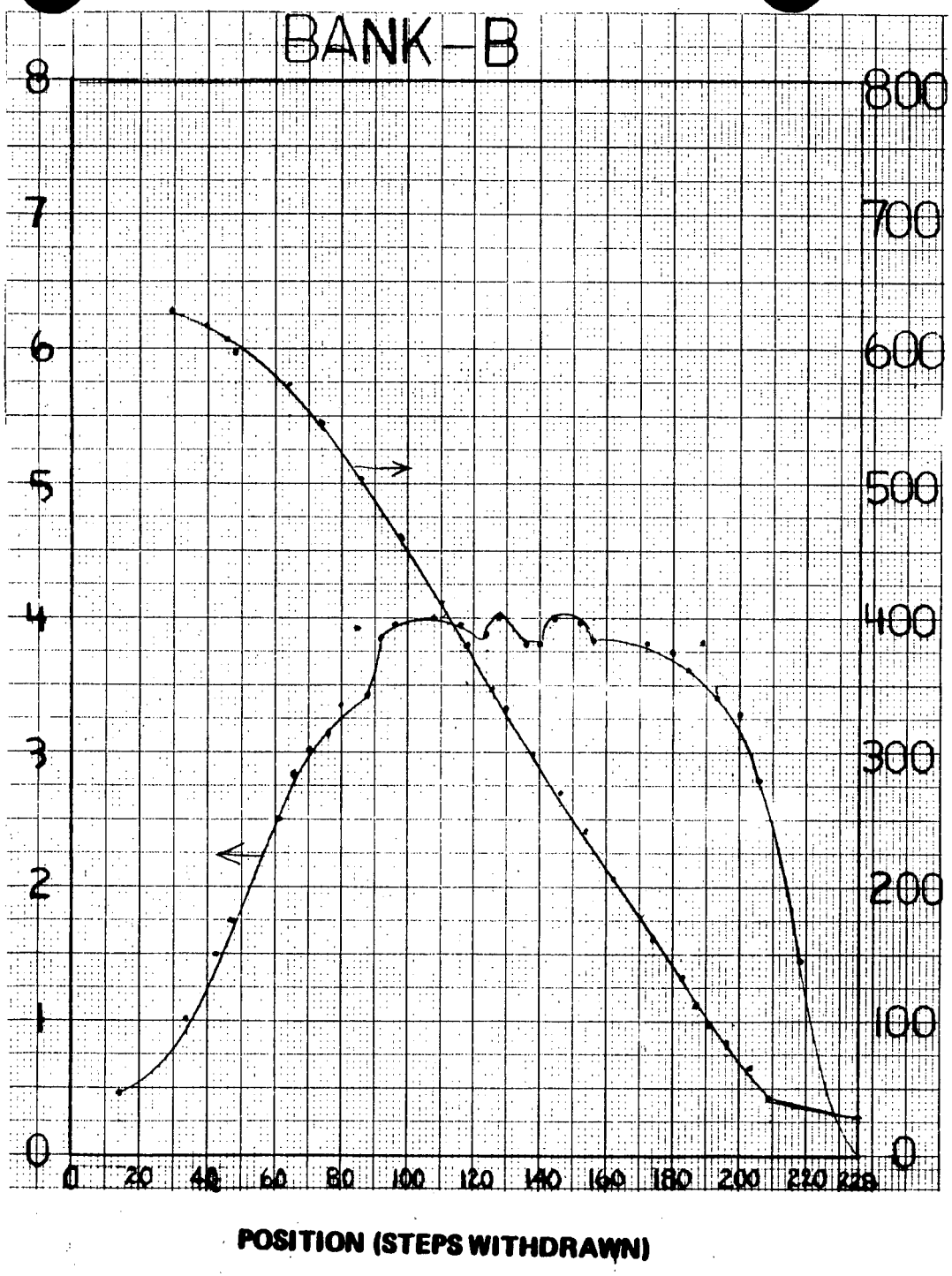
DATE: 10/2/85

TEST CONDITIONS:

RCC BANK POSITIONS:

SDA	228
SDB	228
SDC	228
SDD	228
SDE	N/A
CA	228
CB	228
CC	moving
CD	0

FIGURE 3.6



PLANT: IP-3, Cy5

TEST: RA-4

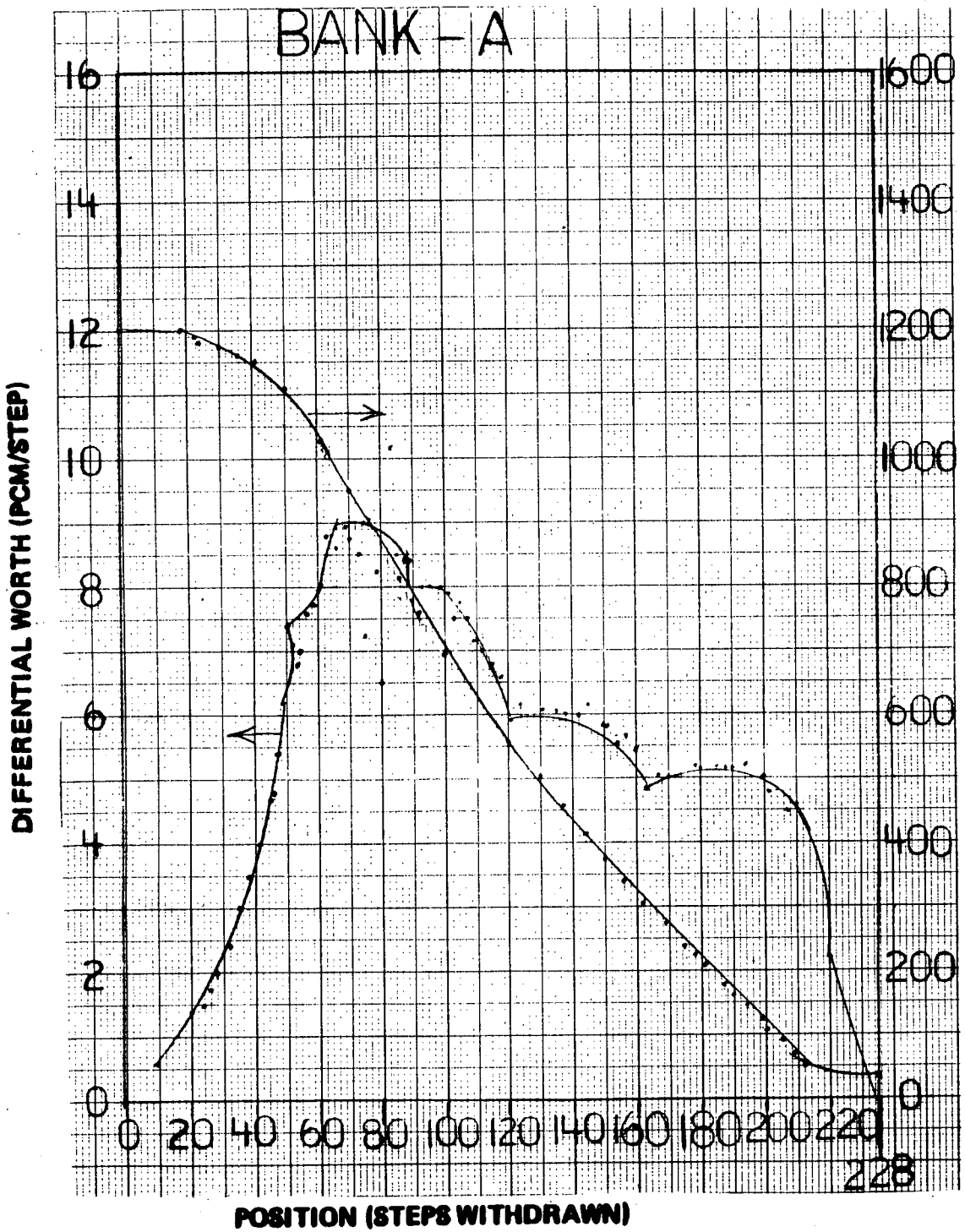
DATE: 10/3/85

TEST CONDITIONS:

RCC BANK POSITIONS:

SDA	228
SDB	228
SDC	228
SDD	228
SDE	N/A
CA	228
CB	moving
CC	0
CD	0

FIGURE 3.7



PLANT: IP-3, Cy5

TEST: RA-4

DATE: 10/3/85

TEST CONDITIONS:

RCC BANK POSITIONS:

SDA	228
SDB	228
SDC	228
SDD	228
SDE	N/A
CA	Moving
CB	0
CC	0
CD	0

FIGURE 3.8

MEASURED EXPECTED FDHN FCFM1 CYCLE 5 FCFM1, 10-2-85 , D/2 0,3,0.0 BU , 1500B

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
R					.411.	.869.	1.017.	.837.	1.087.	.922.	.443.					
					.402.	.857.	1.010.	.831.	1.010.	.857.	.402.					
P			.334.	.714.	1.162.	1.146.	1.289.	1.229.	1.347.	1.190.	1.221.	.765.	.331.			
			.306.	.700.	1.138.	1.131.	1.280.	1.220.	1.280.	1.131.	1.138.	.700.	.306.			
N		.334.	.880.	1.289.	1.185.	1.238.	1.209.	1.302.	1.216.	1.247.	1.242.	1.286.	.872.	.325.		
		.306.	.807.	1.182.	1.161.	1.230.	1.201.	1.299.	1.201.	1.230.	1.161.	1.182.	.807.	.306.		
M		.721.	1.214.	1.210.	1.090.	.851.	1.164.	1.185.	1.200.	.923.	1.216.	1.317.	1.250.	.744.		
		.700.	1.182.	1.250.	1.168.	.912.	1.170.	1.154.	1.170.	.912.	1.168.	1.250.	1.182.	.700.		
L	.389.	1.101.	1.113.	1.119.	1.027.	.989.	.829.	1.081.	.827.	1.015.	1.006.	1.231.	1.264.	1.239.	.438.	
	.402.	1.138.	1.161.	1.168.	1.091.	1.059.	.833.	1.050.	.833.	1.059.	1.091.	1.168.	1.161.	1.138.	.402.	
K	.947.	1.094.	1.178.	.873.	.982.	.757.	.915.	.817.	.907.	.747.	.976.	.993.	1.339.	1.231.	.933.	
	.857.	1.131.	1.230.	.912.	1.059.	.826.	.967.	.862.	.967.	.826.	1.059.	.912.	1.230.	1.131.	.857.	
J	1.115.	1.413.	1.139.	1.110.	.769.	.869.	.990.	.993.	.991.	.872.	.827.	1.244.	1.292.	1.393.	1.100.	
	1.010.	1.280.	1.201.	1.170.	.833.	.967.	1.101.	1.114.	1.101.	.967.	.833.	1.170.	1.201.	1.280.	1.010.	
H	.918.	1.347.	1.179.	1.047.	.948.	.824.	1.047.	.866.	.992.	.783.	1.048.	1.159.	1.382.	1.329.	.917.	
	.831.	1.220.	1.299.	1.154.	1.050.	.862.	1.114.	.929.	1.114.	.862.	1.050.	1.154.	1.299.	1.220.	.831.	
G	1.061.	1.340.	1.140.	1.062.	.756.	.983.	1.071.	1.058.	1.008.	.892.	.826.	1.168.	1.277.	1.411.	1.113.	
	1.010.	1.280.	1.201.	1.170.	.833.	.967.	1.101.	1.114.	1.101.	.967.	.833.	1.170.	1.201.	1.280.	1.010.	
F	.851.	1.125.	1.170.	.827.	.961.	.809.	.927.	.815.	.885.	.762.	.988.	.850.	1.355.	1.246.	.945.	
	.857.	1.131.	1.230.	.912.	1.059.	.826.	.967.	.862.	.967.	.826.	1.059.	.912.	1.230.	1.131.	.857.	
E	.400.	1.132.	1.151.	1.152.	1.050.	.996.	.780.	.975.	.770.	.967.	1.017.	1.216.	1.209.	1.220.	.444.	
	.402.	1.138.	1.161.	1.168.	1.091.	1.059.	.833.	1.050.	.833.	1.059.	1.091.	1.168.	1.161.	1.138.	.402.	
D	.697.	1.171.	1.232.	1.124.	.857.	1.102.	1.088.	1.104.	.937.	1.216.	1.301.	1.230.	.728.			
	.700.	1.182.	1.250.	1.168.	.912.	1.170.	1.154.	1.170.	.912.	1.168.	1.250.	1.182.	.700.			
C	.305.	.800.	1.165.	1.117.	1.155.	1.151.	1.257.	1.186.	1.264.	1.194.	1.221.	.834.	.316.			
	.306.	.807.	1.182.	1.161.	1.230.	1.201.	1.299.	1.201.	1.230.	1.161.	1.182.	.807.	.306.			
B	.302.	.699.	1.137.	1.127.	1.271.	1.212.	1.292.	1.163.	1.170.	.717.	.314.					
	.306.	.700.	1.138.	1.131.	1.280.	1.220.	1.280.	1.131.	1.138.	.700.	.306.					
A					.402.	.854.	1.003.	.826.	1.020.	.881.	.414.					MEAS
					.402.	.857.	1.010.	.831.	1.010.	.857.	.402.					EXP

FIGURE 3.9

MEASURED PERCENT. DIFF. OF FDHN FCFM1 CYCLE 5 FCFM1, 10-2-8 D/215, 0.3,0.0 BU , 1500B

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
R					.411.	.869.	1.017.	.837.	1.087.	.922.	.443.					
					2.1.	1.4.	.7.	.7.	7.6.	7.6.	10.2.					
P			.334.	.714.	1.162.	1.146.	1.289.	1.228.	1.347.	1.190.	1.221.	.765.	.331.			
			9.1.	2.1.	2.1.	1.4.	.7.	.7.	5.2.	5.2.	7.3.	9.4.	8.3.			
N		.334.	.880.	1.289.	1.185.	1.238.	1.209.	1.302.	1.216.	1.247.	1.242.	1.286.	.872.	.325.		
		9.1.	9.1.	9.1.	2.1.	.7.	.7.	.2.	1.3.	1.4.	6.9.	8.9.	8.1.	6.3.		
M		.721.	1.214.	1.210.	1.090.	.851.	1.164.	1.185.	1.200.	.923.	1.216.	1.317.	1.250.	.744.		
		3.1.	2.8.	-3.2.	-6.7.	-6.7.	-.5.	2.7.	2.5.	1.3.	4.1.	5.3.	5.8.	6.3.		
L	.389.	1.101.	1.113.	1.119.	1.027.	.989.	.829.	1.081.	.827.	1.015.	1.006.	1.231.	1.264.	1.239.	.438.	
	-3.2.	-3.2.	-4.1.	-4.2.	-5.9.	-6.7.	-.5.	3.0.	-.7.	-4.2.	-7.9.	5.3.	8.9.	8.9.	8.9.	
K	.947.	1.094.	1.178.	.873.	.982.	.757.	.915.	.817.	.907.	.747.	.976.	.993.	1.339.	1.231.	.933.	
	10.5.	-3.2.	-4.2.	-4.3.	-7.3.	-8.4.	-5.3.	-5.3.	-6.1.	-9.6.	-7.9.	8.9.	8.9.	8.9.	8.9.	
J	1.115.	1.413.	1.139.	1.110.	.769.	.869.	.990.	.993.	.991.	.872.	.827.	1.244.	1.292.	1.393.	1.100.	
	10.5.	10.5.	-5.2.	-5.2.	-7.7.	-10.1.	-10.1.	-10.9.	-10.0.	-9.8.	-.8.	6.3.	7.6.	8.9.	8.9.	
H	.918.	1.347.	1.179.	1.047.	.948.	.824.	1.047.	.866.	.992.	.783.	1.048.	1.159.	1.382.	1.329.	.917.	
	10.5.	10.5.	-9.3.	-9.3.	-9.7.	-4.4.	-6.1.	-6.8.	-11.0.	-9.2.	-.2.	.4.	6.3.	8.9.	10.2.	
G	1.061.	1.340.	1.140.	1.062.	.756.	.983.	1.071.	1.058.	1.008.	.892.	.826.	1.168.	1.277.	1.411.	1.113.	
	5.0.	4.7.	-5.1.	-9.3.	-9.3.	1.7.	-2.8.	-5.0.	-8.5.	-7.7.	-.9.	-.2.	6.3.	10.2.	10.2.	
F	.851.	1.123.	1.170.	.827.	.961.	.809.	.927.	.815.	.885.	.762.	.988.	.850.	1.355.	1.246.	.945.	
	-.7.	-.7.	-4.9.	-9.3.	-9.3.	-2.1.	-4.1.	-5.5.	-8.5.	-7.8.	-6.8.	-6.8.	10.2.	10.2.	10.2.	
E	.400.	1.132.	1.151.	1.152.	1.050.	.996.	.780.	.975.	.770.	.967.	1.017.	1.216.	1.209.	1.220.	.444.	
	-.5.	-.5.	-.8.	-1.4.	-3.7.	-6.0.	-6.4.	-7.1.	-7.6.	-8.7.	-6.8.	4.1.	4.1.	7.2.	10.2.	
D		.697.	1.171.	1.232.	1.124.	.857.	1.102.	1.088.	1.104.	.937.	1.216.	1.301.	1.230.	.728.		
		-.4.	-.9.	-1.4.	-3.7.	-6.0.	-5.9.	-5.7.	-5.7.	2.8.	4.1.	4.1.	4.1.	4.1.		
C		.305.	.800.	1.165.	1.117.	1.155.	1.151.	1.257.	1.186.	1.264.	1.194.	1.221.	.834.	.316.		
		-.4.	-.9.	-1.4.	-3.7.	-6.1.	-4.2.	-3.2.	-1.2.	2.8.	2.8.	3.3.	3.3.	3.3.		
B			.302.	.699.	1.137.	1.127.	1.271.	1.212.	1.292.	1.163.	1.170.	.717.	.314.			
			-1.4.	-.1.	-.1.	-.3.	-.7.	-.7.	1.0.	2.8.	2.8.	2.5.	2.5.			
A					.402.	.854.	1.003.	.826.	1.020.	.881.	.414.					MEAS
					-.1.	-.3.	-.6.	-.7.	1.0.	2.8.	2.8.					DIFF

FIGURE 3.10

MEASURED AND EXPECTED FDHN FCFM3 CYCLE 5 FCFM3, 11-7-85 , D/221.0, 98.82, 577.3 BU , 9858

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
					.405.	.819.	1.033.	.848.	1.023.	.881.	.436.				
R					.412.	.833.	.959.	.805.	.959.	.833.	.412.				
			.324.	.696.	1.084.	1.070.	1.304.	1.253.	1.271.	1.128.	1.123.	.709.	.329.		
P			.329.	.708.	1.103.	1.088.	1.210.	1.162.	1.210.	1.088.	1.103.	.708.	.329.		
		.313.	.778.	1.131.	1.117.	1.197.	1.169.	1.392.	1.240.	1.264.	1.141.	1.151.	.818.	.330.	
N		.329.	.817.	1.152.	1.135.	1.196.	1.168.	1.257.	1.168.	1.196.	1.135.	1.152.	.817.	.329.	
		.674.	1.096.	1.162.	1.166.	.936.	1.199.	1.242.	1.244.	.993.	1.169.	1.207.	1.148.	.711.	
M		.708.	1.152.	1.221.	1.166.	.935.	1.176.	1.159.	1.176.	.935.	1.166.	1.221.	1.152.	.708.	
	.392.	1.049.	1.118.	1.152.	1.129.	1.102.	.904.	1.174.	.951.	1.230.	1.103.	1.153.	1.116.	1.084.	.408.
L	.412.	1.103.	1.135.	1.166.	1.115.	1.101.	.887.	1.098.	.887.	1.101.	1.115.	1.166.	1.135.	1.103.	.412.
	.845.	1.035.	1.182.	.928.	1.105.	.882.	1.043.	.916.	1.015.	.800.	.991.	.920.	1.176.	1.116.	.858.
K	.833.	1.088.	1.196.	.935.	1.101.	.889.	1.036.	.932.	1.036.	.889.	1.101.	.935.	1.196.	1.088.	.833.
	.973.	1.228.	1.197.	1.203.	.895.	1.034.	1.164.	1.135.	1.110.	.933.	.829.	1.233.	1.186.	1.246.	.992.
J	.959.	1.210.	1.168.	1.176.	.887.	1.036.	1.170.	1.187.	1.170.	1.036.	.887.	1.176.	1.168.	1.210.	.959.
	.818.	1.180.	1.246.	1.165.	1.098.	.920.	1.164.	.960.	1.128.	.862.	1.097.	1.163.	1.317.	1.252.	.868.
H	.805.	1.162.	1.257.	1.159.	1.098.	.932.	1.187.	1.006.	1.187.	.932.	1.098.	1.159.	1.257.	1.162.	.805.
	.997.	1.260.	1.201.	1.181.	.892.	1.022.	1.119.	1.157.	1.148.	1.007.	.882.	1.190.	1.218.	1.242.	1.005.
G	.959.	1.210.	1.168.	1.176.	.887.	1.036.	1.170.	1.187.	1.170.	1.036.	.887.	1.176.	1.168.	1.210.	.959.
	.888.	1.160.	1.232.	.927.	1.092.	.849.	.990.	.903.	1.031.	.866.	1.047.	.931.	1.242.	1.135.	.873.
F	.833.	1.088.	1.196.	.935.	1.101.	.889.	1.036.	.932.	1.036.	.889.	1.101.	.935.	1.196.	1.088.	.833.
	.439.	1.174.	1.137.	1.091.	1.060.	1.058.	.860.	1.077.	.882.	1.086.	1.089.	1.217.	1.188.	1.152.	.432.
E	.412.	1.103.	1.135.	1.166.	1.115.	1.101.	.887.	1.098.	.887.	1.101.	1.115.	1.166.	1.135.	1.103.	.412.
		.663.	1.079.	1.143.	1.108.	.899.	1.142.	1.131.	1.168.	.922.	1.149.	1.244.	1.209.	.743.	
D		.708.	1.152.	1.221.	1.166.	.935.	1.176.	1.159.	1.176.	.935.	1.166.	1.221.	1.152.	.708.	
		.323.	.784.	1.104.	1.079.	1.155.	1.134.	1.223.	1.134.	1.166.	1.108.	1.148.	.819.	.330.	
C		.329.	.817.	1.152.	1.135.	1.196.	1.168.	1.257.	1.168.	1.196.	1.135.	1.152.	.817.	.329.	
			.323.	.701.	1.104.	1.088.	1.181.	1.131.	1.160.	1.060.	1.075.	.687.	.314.		
B			.329.	.708.	1.103.	1.088.	1.210.	1.162.	1.210.	1.088.	1.103.	.708.	.329.		
					.413.	.833.	.938.	.784.	.919.	.803.	.397.				MEAS
A					.412.	.833.	.959.	.805.	.959.	.833.	.412.				EXP

FIGURE 3.11

MEASURED AND PERCENT, DIFF, OF FDHN FCFM3 CYCLE 5 FCFM3, 11-7-85 , D/221.0, 98.82, 577.3 RU , 9858

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
R					.405.	.819.	1.033.	.868.	1.023.	.891.	.426.					
					-1.6.	-1.6.	7.8.	7.8.	6.8.	5.7.	3.5.					
P			.324.	.696.	1.084.	1.070.	1.304.	1.253.	1.271.	1.128.	1.123.	.709.	.329.			
			-1.6.	-1.6.	-1.6.	-1.6.	7.8.	7.8.	5.1.	3.7.	1.8.	.1.	.1.			
N		.313.	.778.	1.133.	1.117.	1.197.	1.169.	1.392.	1.240.	1.244.	1.141.	1.151.	.818.	.330.		
		-4.8.	-4.8.	-1.6.	-1.6.	.1.	.1.	10.7.	6.2.	5.7.	.5.	-.1.	.1.	.4.		
M		.674.	1.096.	1.162.	1.166.	.936.	1.199.	1.242.	1.244.	.993.	1.169.	1.207.	1.148.	.711.		
		-4.8.	-4.8.	-4.8.	.1.	.1.	1.9.	7.2.	5.7.	6.2.	.3.	-1.1.	-.4.	.4.		
L	.392.	1.049.	1.118.	1.152.	1.129.	1.102.	.904.	1.174.	.951.	1.220.	1.103.	1.153.	1.116.	1.084.	.405.	
	-4.8.	-4.8.	-1.5.	-1.2.	1.2.	.1.	1.9.	6.9.	7.2.	10.7.	-1.1.	-1.1.	-1.7.	-1.7.	-1.7.	
K	.845.	1.035.	1.182.	.928.	1.105.	.882.	1.043.	.916.	1.015.	.800.	.991.	.920.	1.176.	1.116.	.858.	
	1.5.	-4.8.	-1.2.	-.8.	.3.	-.8.	.7.	-1.8.	-2.1.	-10.0.	-10.0.	-1.7.	-1.7.	2.6.	3.0.	
J	.973.	1.228.	1.197.	1.203.	.895.	1.036.	1.164.	1.138.	1.110.	.933.	.929.	1.233.	1.184.	1.246.	.992.	
	1.5.	1.5.	2.5.	2.2.	.9.	-.0.	-.6.	-4.4.	-5.1.	-10.0.	4.8.	4.8.	1.6.	3.0.	3.5.	
H	.818.	1.180.	1.246.	1.165.	1.098.	.920.	1.164.	.960.	1.128.	.862.	1.097.	1.163.	1.317.	1.252.	.868.	
	1.5.	1.5.	-.9.	.6.	-.0.	-1.3.	-1.9.	-4.5.	-4.9.	-7.5.	-.1.	.4.	4.8.	7.7.	7.7.	
G	.997.	1.260.	1.201.	1.181.	.892.	1.022.	1.119.	1.157.	1.165.	1.007.	.882.	1.190.	1.218.	1.242.	1.005.	
	4.0.	4.2.	2.8.	.4.	.6.	-1.3.	-4.4.	-2.5.	-.5.	-2.8.	-.6.	1.2.	4.3.	4.3.	4.8.	
F	.888.	1.160.	1.232.	.927.	1.092.	.849.	.990.	.903.	1.031.	.866.	1.047.	.931.	1.242.	1.135.	.873.	
	6.7.	6.7.	3.0.	-.9.	-.9.	-4.5.	-4.5.	-3.1.	-.5.	-2.7.	-5.0.	-.4.	3.8.	4.3.	4.8.	
E	.439.	1.176.	1.137.	1.091.	1.060.	1.058.	.860.	1.077.	.882.	1.096.	1.099.	1.217.	1.185.	1.152.	.432.	
	6.7.	6.7.	.1.	-6.4.	-4.9.	-4.0.	-3.0.	-1.9.	-.6.	-.5.	-1.4.	4.4.	4.4.	4.5.	4.8.	
D		.663.	1.079.	1.143.	1.108.	.899.	1.142.	1.131.	1.168.	.922.	1.149.	1.244.	1.209.	.743.		
		-6.4.	-6.4.	-6.4.	-4.9.	-3.9.	-2.9.	-2.4.	-.7.	-1.4.	-1.4.	1.9.	5.0.	5.0.		
C		.323.	.784.	1.104.	1.079.	1.155.	1.134.	1.223.	1.134.	1.166.	1.108.	1.148.	.819.	.330.		
		-1.9.	-4.1.	-4.2.	-4.9.	-3.5.	-2.9.	-2.7.	-3.0.	-2.5.	-2.4.	-.3.	.3.	.3.		
B			.323.	.701.	1.104.	1.088.	1.181.	1.131.	1.160.	1.060.	1.075.	.687.	.314.			
			-1.9.	-.9.	.1.	-.0.	-2.4.	-2.6.	-4.1.	-2.6.	-2.5.	-3.0.	-4.4.			
A					.413.	.833.	.938.	.786.	.919.	.803.	.397.					MEAS
					.1.	-.0.	-2.2.	-2.4.	-4.1.	-3.5.	-3.5.					DIFF

FIGURE 3.12

4.1 Incore Thermocouple, Wide Range RTD and Narrow Range RTD Measurement

The primary purpose of this test was to determine which narrow range RTD's were to be used for reactor protection and control. This was accomplished by making comparative measurements of narrow range RTD's at five different temperatures (349, 396, 452, 503 and 539 °F) while the reactor coolant system was held in an approximately isothermal condition. Only narrow range RTD's that deviated from the mean by less than 1.8°F at all temperatures were selected to be used for reactor protection and control. The results of these measurements are listed on Table 4.1.

Additionally, this test collected wide range RTD readings and incore thermocouple temperatures at the same setpoints.

4.2 Incore - Excore Detector Calibration

One full-core map and 5 quarter core maps were taken at approximately 90% power to obtain calibation data for the excore instrumentation. These maps covered a range in axial offset from -12.15% to 12.166 % generated by insertion of control bank D and the resultant axial xenon oscillation produced upon withdrawal. INCORE analyses provided a measured value of the core average axial offset which was used as the basis of the excore calibration. The results of the calibration are listed in Table 4.2.

Table 4.1

Results of Narrow Range RTD Measurement

Deviations from Mean RCS Temperature (°F)

Avg. T_{RCS} (°F)

RTD #	349	396	452	503	539
410A*	0.12	0.31	0.22	0.26	0.34
411A	0.24	0.40	0.16	0.22	0.34
410B*	0.01	0.05	0.70	0.18	0.06
411B	0.37	0.47	0.84	0.91	0.25
420A*	0.18	0.42	0.11	0.22	0.31
421A	0.18	0.12	0.16	0.28	0.26
420B*	0.26	0.24	0.34	0.14	0.04
421B	0.16	0.03	0.29	0.15	0.04
430A*	0.23	0.25	0.34	0.09	0.08
431A	0.19	0.21	0.05	0.22	0.16
430B*	0.09	0.18	0.05	0.24	0.31
431B	0.02	0.07	0.20	0.01	0.02
440A*	0.14	0.16	0.21	0.17	0.09
441A	0.09	0.12	0.27	0.22	0.05
440B*	0.01	0.02	0.64	0.02	0.38
441B	0.05	0.05	0.09	0.09	0.29

* Selected to be used for reactor protection and control.

-EXCORE
1CY-5 INCORE-EXCORE CALIBRATION (11-1-85)

CALIBRATION CURVES:

DETECTOR	EQUATION		
41-T	155.4	.99	(A0)
41-B	171.0	-.99	(A0)
42-T	226.2	1.27	(A0)
42-B	207.8	-1.27	(A0)
43-T	212.5	1.33	(A0)
43-B	223.3	-1.33	(A0)
44-T	184.1	1.23	(A0)
44-B	213.3	-1.23	(A0)

SUMMATION OF EXCORE DETECTOR DATA AND CALCULATIONS:

MAP ID	INCORE AXIAL OFFSET	POWER LEVEL	DETECTOR	AVERAGE CURRENT	POWER NORM. CURRENT	TOTAL NORM. CURRENT	COMP. CURRENT	PERCENT DIFF.
QC04	-12.150	.921	41-T	132.0	143.3	143.2	143.4	-.14
			41-B	169.0	183.5	183.3	183.1	.11
			42-T	192.7	209.2	210.3	210.7	-.22
			42-B	205.0	222.6	223.7	223.3	.21
			43-T	181.0	196.5	196.6	196.3	.13
			43-B	220.3	239.2	239.3	239.5	-.11
			44-T	156.3	169.7	169.0	169.1	-.11
			44-B	211.3	229.5	228.4	228.2	.08
QC03	-8.509	.916	41-T	134.0	146.3	147.0	147.0	-.01
			41-B	163.7	178.7	179.5	179.5	.01
			42-T	197.0	215.1	215.9	215.4	.25
			42-B	199.0	217.2	218.1	218.7	-.25
			43-T	184.0	200.9	201.3	201.2	.08
			43-B	214.3	234.0	234.5	234.7	-.07
			44-T	160.3	175.0	174.4	173.6	.45
			44-B	205.0	223.8	223.0	223.7	-.35
QC02	-2.211	.901	41-T	138.3	153.5	153.6	153.2	.25
			41-B	155.7	172.8	172.9	173.2	-.22
			42-T	201.0	223.1	223.3	223.4	-.03
			42-B	189.7	210.5	210.7	210.6	.04
			43-T	188.0	208.7	208.7	209.6	-.43
			43-B	204.7	227.2	227.2	226.3	.40
			44-T	163.7	181.7	181.0	181.4	-.20
			44-B	195.7	217.2	216.4	216.0	.17
QC01	2.691	.892	41-T	141.3	158.4	158.4	158.1	.18
			41-B	150.0	168.2	168.1	168.4	-.16
			42-T	205.0	229.8	229.9	229.6	.13
			42-B	182.0	204.0	204.1	204.4	-.14
			43-T	192.7	216.0	216.6	216.1	.23
			43-B	195.0	218.6	219.2	219.7	-.23
			44-T	166.3	186.5	187.1	187.4	-.17
			44-B	187.0	209.6	210.3	210.0	.16
QC02	5.520	.895	41-T	144.1	161.0	160.5	160.9	-.29
			41-B	149.1	166.6	166.0	165.6	.28
			42-T	210.5	235.2	233.0	233.2	-.11
			42-B	181.7	203.0	201.1	200.8	.12
			43-T	198.1	221.3	219.7	219.9	-.10
			43-B	194.9	217.8	216.2	215.9	.10
			44-T	171.0	191.1	190.4	190.9	-.26
			44-B	185.9	207.7	207.0	206.5	.24
QC06	12.166	.893	41-T	149.7	167.6	167.5	167.5	.01
			41-B	142.0	159.0	158.9	159.0	-.01
			42-T	216.0	241.9	241.6	241.7	-.02
			42-B	172.0	192.6	192.4	192.4	.02
			43-T	204.0	228.4	229.0	228.8	.09
			43-B	184.3	206.4	206.9	207.1	-.09
			44-T	176.0	197.1	199.6	199.0	.30
			44-B	174.3	195.2	197.7	198.3	-.30

STOP.
RDY

IDLE.

IDLE.

APPENDIX A

Measurement of the Power Coefficient

1.0 INTRODUCTION

A measurement of the power coefficient was performed at the beginning of cycle 5 of Indian Point Unit 3 on November 2, 1985. The method utilized involved exchanging power for RCS temperature while maintaining constant rod position and boron concentration. Power level was monitored via the core ΔT since no other power signal is either accurate enough or unaffected by the changing RCS temperature. Specifically, calorimetrics are not accurate enough because of the small power changes involved ($\sim$2%) and the NIS are also inaccurate due to the RCS temperature deviating from the programmed temperature. The purpose of this report is to present the measurement results and the data analysis.

2.0 MEASUREMENT RESULTS

RCS temperature T_{avg} and core average ΔT were hooked up to a two-pen stripchart recorder and scaled to 1°F/inch.

The conditions of the plant at the time of the measurement were as follows:

Power	= 87.3%
Boron Conc.	= 1045 ppm
Tavg	= 562.7°F
D Position	= 211 steps

Temperature results from the measurements are summarized with the Data Analysis in Table A-1.

3.0 DATA ANALYSIS

The analysis of the power coefficient data is somewhat involved and is presented in flow chart form in Figure 1. Note that even though the RCS temperature changed during the experiment, the final power level (Q_f) is evaluated using the initial RCS temperature. This is done in order to insure that the final answer is in the form of the ratio of the isothermal temperature coefficient to the doppler-only power coefficient. That is, the doppler-only power coefficient is defined as a change in power at constant RCS temperature. Therefore in the analysis no RCS temperature change should be used.

Results of these calculations are shown below:

TABLE A-1

Results of Data Analysis

INT CY5 87.3% Power CB=1045 PPM

	Initial	(°F)		Final	(°F)	Delta	Doppler
Tavg	Delta-T	Power	Tavg	Delta-T	Power	Power	C(DEGF/PCT)
561.55	50.30	88.29	564.37	49.12	86.14	2.15	-1.312
564.37	49.12	86.40	561.00	50.40	88.74	-2.34	-1.439
561.00	50.40	88.42	564.55	48.90	85.69	2.73	-1.300
564.55	48.90	86.01	560.30	50.41	88.77	-2.76	-1.539

Average Value -1.397

At 562.71 DEGF

At 87.31 % power

Standard Deviation .113

4.0 SUMMARY

The power coefficient calculated in Table 1 has the units of °F per percent power. To arrive at a doppler-only power coefficient in terms of the more familiar pcm per percent power a calculated isothermal temperature coefficient must be used. This value can be obtained from WCAP 10839, Figure 5.1a using the measured conditions of 562.7°F Tavg and 1045 ppm boron concentration. Using linear interpolation in Figure 5.1a (BOL) the expected isothermal temperature coefficient is (-8.57) pcm/°F.

During the zero power physics testing it was found that the predicted isothermal temperature coefficients are biased more postive than the measured values by (0.101) pcm/°F. That is, the measured isothermal temperature coefficient is (0.101) pcm/°F more negative than predicted. Therefore, the proper iosthermal temperature coefficient to be used in the analysis should be the predicted value biased (0.101) pcm/°F more negative:

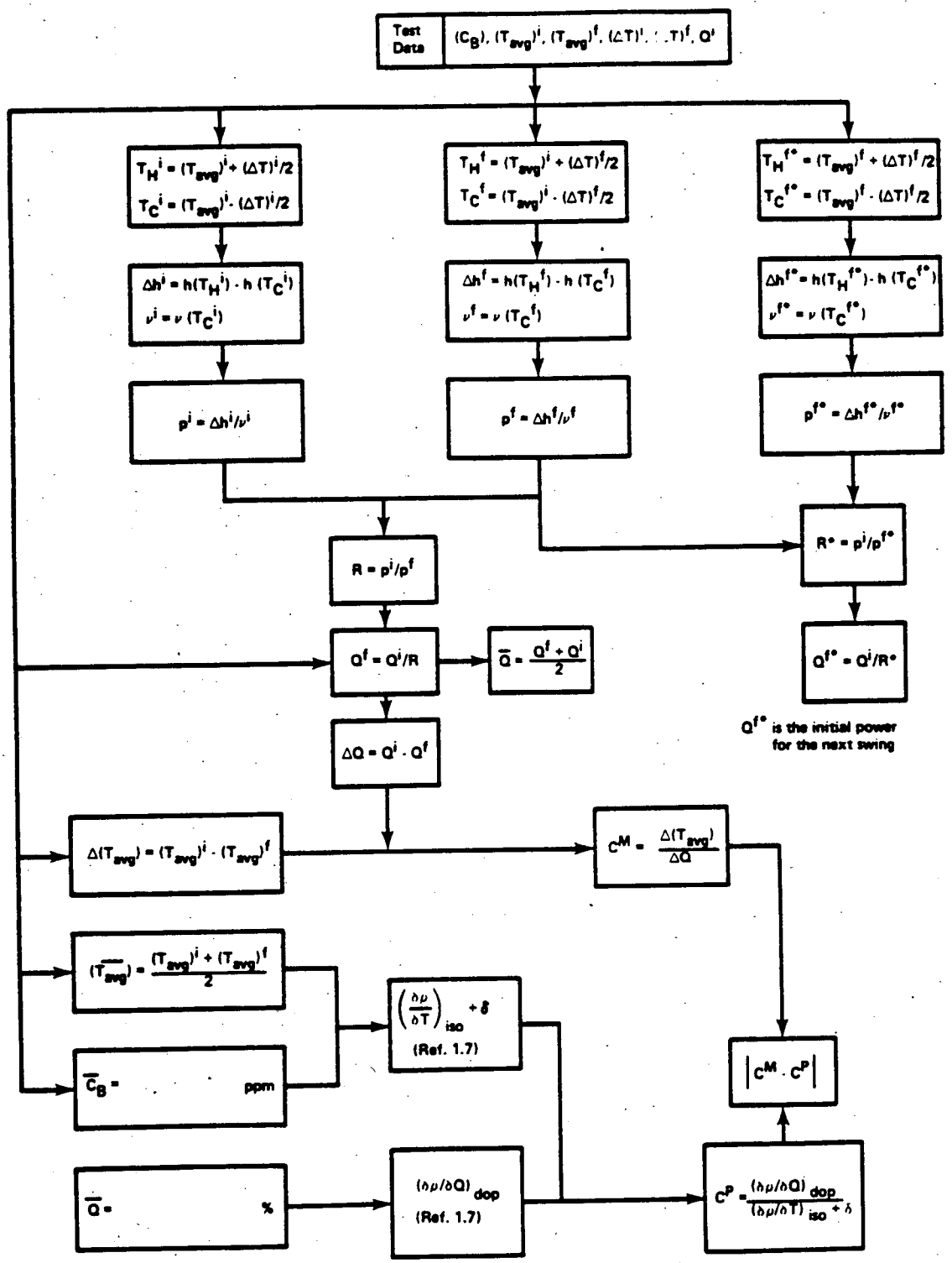
$$\frac{\delta\rho}{\delta T_{iso}} = (-8.57 - .101) = -8.671 \text{ pcm/°F}$$

Therefore the measured doppler-only power coefficient is:

$$- (-8.671 \text{ pcm/°F}) \times (-1.397 \text{ °F/\%}) = -12.11 \text{ pcm/\%}$$

This compares favorably with the design value of -10.6 pcm/% transmitted from Westinghouse to NYPA on November 1, 1985. The procedural acceptance criteria is ± 2 pcm /%.

FIGURE A-1 - DATA ANALYSIS FLOW DIAGRAM



APPENDIX B

Core Loading Sequence

for Indian Point 3

Cycle 4/5

The following pages are taken

from IP3 Refueling Procedure

SOP-RP-1, pages 203 through 296

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 203

REVISED DATE

BEGIN PHASE I

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
1	8-11-85 1541	R76		R108			H2														X			1549
1a	8-11-85 1512	S08	173				H15															X		1521
1b	8-11-85 1552		173											X					X					XXXXX
1c	8-11-85 1555			R108									X									X		1557
1d	XXXXX		173								X										X			1601
1e	8-11-85 1603	R76	173										X					X						1607
1f	8-11-85 1616	R76	173							X							W14							1623
1g	8-11-85 1610	S08		R108										X		H2								1619
2	8-11-85 1527	S64	184				R6									H15								1536
3	8-11-85 1625	T11	63Z						E3									X						1630
3a	8-11-85 1635	T11	63Z							X						R6								1643
4	8-11-85 1622	R14		R82			P8														X			1630

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 204

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
4a	8-11-85 1646	S34	6				A8															X		~~1~~ 1654
4b	8-11-85 1657		6											X					X					XXXXX
4c	8-11-85 1658			R82									X									X		~~1~~ 1700
4d	XXXXXX		6								X										X			~~B~~ 1705
4e	8/11/85 1707	R14	6										X					X						~~B~~ 1716 ~~1713~~
4f	8/11/85 1722	R14	6							X							W15							~~B~~ 1727
4g	8/11/85 1720	S34		R82										X		P8								~~B~~ 1731
5	8/11/85 1736	S50	13				K15									A8								~~B~~ 1745
6	8/11/85 1730	T06	53Z						E4									X						~~B~~ 1734
6a	8/11/85 1750	T06	53Z							X						K15								~~B~~ 1758
7	8/11/85 1837	R20		R72			H14														X			~~B~~ 1849
7a	8/11/85 1802	S30	152				H1															X		~~B~~ 1810

FANDR #2

FANDR #3
FANDR #4

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 205

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
7b	8/11/85 1856		152											X					X					XXXXX
7c	8/11/85 1858			R72									X									X		β 1901
7d	XXXXXX		152								X										X			β 1906
7e	8/11/85 1908	R20	152										X					X						β 1913
7f	8/11/85 1920	R20	152							X							W16							β 1926
7g	8/11/85 1916	S30		R72										X		H14								β 1925
8	8/11/85 1815	S41	141				A10									H1								β 1823
9	8/11/85 1929	R75		R99			B8														X			β 1938
* 9a	8/11/85 1945	S03	238				R8															X		β 2003
9b	8/11/85 2007		238											X					X					XXXXX
9c	8/11/85 2011			R99									X									X		β 2017
9d	XXXXXX		238								X										X			β 2019

FANDL #5

FP-INT-R4 Rev.0

* VIDEOTAPE F/A S03

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 206

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
9e	8/11/85 2021	R75	238										X					X						B 2026
9f	8/11/85 2034	R75	238							X							W17							B 2034
9g	8/11/85 2030	S03		R99										X		B8								B 2039
10	8/11/85 2043	S43	187				F1									R8								B 2050
11	8/11/85 2041	T12	62Z						E6									X						B 2046
11a	8/11/85 2055	T12	62Z							X						F1								B 2102
12	8/11/85 2053	T18	59Z						E7									X						B 2102
12a	8/11/85 2105	S67	221				F15															X		B 2113
12b	8/11/85 2116	T18	59Z							X						F15								B 2123
* 13	8/11/85 2127	P36		R101			H10														X			B 2153
13a	8/11/85 2157		221											X					X					XXXXX
13b	8/11/85 2201			R101									X									X		B 2203

FANOR#1
FANOR#7

FP-INT-R4 Rev.0

* VIDEOTAPE F/A P36

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 207

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
13c	XXXXXX		221								X										X			β 2205
13d	8/11/85 2207	P36	221										X					X						2212
13e	8/11/85 2217	P36	221							X							W18							β 2223
13f	8/11/85 2225	R52		R71			N3									H10								β 2225
14	8/11/85 2241	S67		R101										X		N3								β 2252
15	8/11/85 0055	S39	145				R10															X		β 0105
* 15a	8/12/85 0110	P08		R97			K8														X			β 0133
15b	8/12/85 0138		145											X					X					XXXXX
15c	8/12/85 0143			R97									X									X		β 0147
15d	XXXXXX		145								X										X			β 0150
15e	8/12/85 0153	P08	145										X					X						β 0158
15f	8/12/85 0205	P08	145							X							W19							β 0212

FANOR #8
FANOR #9
FANOR #10
FANOR #11
FANOR #12

* VIDEO TAPE #A P.08

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FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
15g	8/12/85 0203	R66		R70			C3									K8								B 0211
16	8-12-85 0805	T10	51Z						E9									X						2h 0812
16a	8/12/85 0222	S39		R97										X		C3								B 0231
17	8-12-85 0806	S63	135				K1															X		2h 0813
17a	8-12-85 0818	T10	51Z							X						K1								2h 0826
18	8-12-85 0829	P51		R69			H6														X			2h 0838
18a	8-12-85 0840		135											X					X					XXXXX
18b	8-12-85 0841			R69									X									X		2h 0844
18c	XXXXXX		135								X										X			2h 0846
18d	8-12-85 0847	P51	135										X					X						2h 0851
18e	8-12-85 0859	P51	135							X							W20							2h 0906
18f	8-12-85 0904	R70		R109			C13									H6								2h 0915

FAHDR 13 →

EFFECTIVE DATE JUL 08 1995

PAGE 2 of 8

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 209

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
19	8-12-85 0909	T34	58Z						E10									X						ch 0913
19a	8-12-85 0923	S63		R69										X		C13								ch 0932
* 20	8-12-85 0935	S48	244				A6															X		ch 0949
20a	8-12-85 0951	T34	58Z							X						A6								ch 0959
21	8-12-85 1002	P29		R104			F8														X			ch 1010
21a	8-12-85 1013		244											X					X					XXXXXX
21b	8-12-85 1014			R104									X									X		ch 1017
21c	XXXXXX		244								X										X			ch 1019
21d	8-12-85 1020	P29	244										X					X						ch 1024
21e	8-12-85 1029	P29	244							X							W21							ch 1036
21f	8-12-85 1028	R10		R73 ~~R23~~			N13									F8								ch 1036
22	8-12-85 1039	T25			12P 3WZ				E11									X						ch 1043

TPC 85-113 OK 8/10/85 a.e.

* VIDEO TAPE F/A 548

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 210

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
22a	8-12-85 1041	S48		R104										X		N13								1049
* 23	8-12-85 1052	R23	195				L10															X		1105
23a	8-12-85 1106	T25			12P 3WZ					X						L10								1113
24	8-12-85 1116	R67		R76			E9														X			1124
24a	8-12-85 1126		195											X					X					XXXXX
24b	8-12-85 1127			R76									X									X		1130
24c	XXXXXX		195								X										X			1132
24d	8-12-85 1133	R67	195										X					X						1137
24e	8-12-85 1142	R67	195							X							W22							1148
24b	8-12-85 1332	T29			12P 13WZ				E12									X						1339
24g	8-12-85 1138	R23		R76										X		E9								1146
** 25	8-12-85 1334	R08	137				E6															X		1347

* VIDEO TAPE F/A R23.

* VIDEO TAPE D.T 08

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
25a	8-12-85 1350	T29			12P 13WZ					X						E6								2h 1357
26	8-12-85 1400	R39		R66			L7														X			2h 1407
26a	8-12-85 1410		137											X					X					XXXXX
26b	8-12-85 1411			R66									X									X		2h 1415
26c	XXXXXX		137								X										X			2h 1417
26d	8-12-85 1420	R39	137										X					X						2h 1424
26e	8-12-85 1429	R39	137							X							W23							2h 1436
26f	8-12-85 1438	T27			12P 18WZ				E13									X						2h 1442
26g	8-12-85 1426	R08		R66										X		L7								2h 1433
27	8-12-85 1436	R04	149				F11															X		2h 1443
27a	8-12-85 1446	T27			12P 18WZ					X						F11								2h 1453
28	8-12-85 1456	R15		R68			G5														X			2h 1504

EFFECTIVE DATE JUL 08 1985

PAGE 211

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 2 of 2

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
28a	8-12-85 1506		149											X					X					XXXXX
28b	8-12-85 1508			R68									X									X		1511
28c	XXXXXX		149								X										X			1513
28d	8-12-85 1514	R15	149										X					X						1518
28e	8-12-85 1523	R15	149							X							W24							1529
28f	8-12-85 1530	T17			12P 24WZ				E14									X						1534
28g	8-12-85 1520	R04		R68										X		G5								1527
29	8-12-85 1530	R36	10				K5															X		1537
29a	8-12-85 1539	T17			12P 24WZ					X						K5								1545
30	8-12-85 1548	R73		R89			J11														X			1555
30a	8-12-85 1557		10											X					X					XXXXX
30b	8-12-85 1559			R89									X									X		1602

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
30c	XXXXXX		10								X										X			ZL 1604
30d	8-12-85 1605	R73	10										X					X						ZL 1609
30e	8-12-85 1615	R73	10							X							W25							ZL 1619
30f	8-12-85 1612	R36		R89										X		J11								ZL 1620
31	8-12-85 1623	R28	189				J5											X						ZL 1629
31a	8/12/85 1635	R28	189							X							W26							B 1640
31b	8/12/85 1642	T19			12P 6WZ				E15									X						B 1646
31c	8-12-85 1635	R21	151				K11									J5								B 1641
32	8/12/85 1652	T19			12P 6WZ					X						K11								B 1659
33	8/12/85 1703	R63	218				E7											X						B 1709
33a	8/12/85 1714	R63	218							X							W27							B 1718
33b	8/12/85 1721	T33			12P 23WZ				E16									X						B 1724

EFFECTIVE DATE JUL 08 1985

PAGE 213

REVISED DATE

NSID 101.4 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
33c	8/12/85 1715	R09	11				L6									E7								B 1723
34	8/12/85 1730	T33			12P 23WZ					X						L6								B 1737
35	8/12/85 1741	R69	209				G11											X						B 1749
35a	8/12/85 1755	R69	209							X							V10							B 1801
35b	8/12/85 1804	T05			12P 8WZ				E17									X						B 1808
35c	8/12/85 1753	R57	254				F5									G11								B 1801
36	8/12/85 1813	T05			12P 8WZ					X						F5								B 1821
37	8/12/85 1829	R44	237				L9											X						B 1836
37a	8/12/85 1842	R44	237							X							V11							B 1847
37b	8/12/85 1850	T26			12P 5WZ				E18									X						B 1854
37c	8/12/85 1841	R16	134				E10									L9								B 1848
38	8/12/85 1859	T26			12P 5WZ					X						E10								B 1907

EFFECTIVE DATE JUL 08 1985

PAGE 214

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 215

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
39	8/12/85 1910	R29	8				L8											X						B 1917
39a	8/12/85 1925	R29	8							X							V12							B 1931
39b	8/12/85 1922	R12	190				E8											X						B 1932
39c	8/12/85 1937	R12	190							X							V13							B 1941
39d	8/12/85 1945	T02			12P 21WZ				E19									X						B 1948
39e	8/12/85 1953	T02			12P 21WZ					X						L8								B 2000
40	8/12/85 1954	T15			12P 17WZ				E20									X						B 1959
40a	8/12/85 2005	T15			12P 17WZ					X						E8								HOP 2011
41	8/12/85 2020	S51			12P 43X		R9											X						HOP 2027
41a	8/12/85 2032	S51			12P 43X					X							Q11							HOP 2037
41b	8/12/85 2031	S54			12P 41X		R7											X						HOP 2039
41c	8/12/85 2044	S54			12P 41X					X							Q12							HOP 2049

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev. 0

EAHOR 14

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
41d	8/12/85 2045	S68			12P 33X		J1											X						HWP 2051
41e	8/12/85 2055	S68			12P 33X					X							Q13							HWP 2100
41f	8/12/85 2055	S58			12P 45X		G1											X						HWP 2103
41g	8/12/85 2108	S58			12P 45X					X							Q14							HWP 2112
41h	8/12/85 2107	S42			12P 25X		A7											X						HWP 2115
41i	8/12/85	S42			12P 25X					X							Q15							HWP 2124
41j	8/12/85 2119	S47			12P 30X		A9											X						HWP 2126
41k	8/12/85 2132	S47			12P 30X					X							Q16							HWP 2136
41l	8/12/85 2353	S62			12P 32X		G15											X						B 0000
41m	8/13/85 0004	S62			12P 32X					X							Q17							B 0008
41n	8/13/85 0004	S49			12P 24X		J15											X						B 0011
41o	8/13/85 0015	S49			12P 24X					X							Q18							B 0018

EFFECTIVE DATE JUL 08 1985

PAGE 216

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
41p	8/13/85 0019	T39	7Z						E21									X						B 0023
41q	8/13/85 0027	T39	7Z							X						R9								B 0034
42	8/13/85 0025	T51	35Z						E22									X						B 0033
42a	8/13/85 0038	T51	35Z							X						R7								B 0047
43	8/13/85 0035	T68	9Z						E23									X						B 0046
43a	8/13/85 0050	T68	9Z							X						J1								B 0057
44	8/13/85 0048	T58	5Z						E24									X						B 0056
44a	8/13/85 0100	T58	5Z							X						G1								B 0107
45	8/13/85 0058	T48	57Z						E25									X						B 0106
45a	8/13/85 0111	T48	57Z							X						A7								B 0117
46	8/13/85 0108	T42	8Z						E26									X						B 0116
46a	8/13/85 0121	T42	8Z							X						A9								B 0128

EFFECTIVE DATE JUL 08 1995

PAGE 217

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 218

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
47	8/13/85 0119	T62	55Z						D3									X						B 0127
47a	8/13/85 0132	T62	55Z							X						G15								B 0138
48	8/13/85 0129	T49	15Z						D4									X						B 0137
48a	8/13/85 0142	T49	15Z							X						J15								B 0145
49	8/13/85 0152	S38			C8 P7		P11											X						B 0159
49a	8/13/85 0203	S38			C8 P7					X							Q19							B 0207
49b	8/13/85 0202	S73			C8 P4		P5											X						B 0210
49c	8/13/85 0214	S73			C8 P4					X							Q20							B 0217
49d	8/13/85 0213	S57			C8 P5		L2											X						B 0220
49e	8/13/85 0224	S57			C8 P5					X							Q21							B 0228
49f	8-13-85 0749	S66			C8 P1		E2											X						2h 0756
49g	8-13-85 0801	S66			C8 P1					X							Q22							2h 0806

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
49h	8-13-85 0800	S40			C8 P3		B5											X						ZL 0807
49i	8-13-85 0812	S40			C8 P3					X							Q23							ZL 0817
49j	8-13-85 0811	S75			C8 P8		B11											X						ZL 0818
49k	8-13-85 0824	S75			C8 P8					X							Q24							ZL 0829
49l	8-13-85 0822	S52			C8 P2		E14											X						ZL 0832
49m	8-13-85 0838	S52			C8 P2					X							Q25							ZL 0845
49n	8-13-85 0835	S56			C8 P6		L14											X						ZL 0845
49o	8-13-85 0852	S56			C8 P6					X							Q26							ZL 0858
49p	8-13-85 0900	T54			4P 4WZ				D5									X						ZL 0906
49q	8-13-85 0909	T54			4P 4WZ					X						P11								ZL 0917
50	8-13-85 0908	T38			4P 8WZ				D6									X						ZL 0916
50a	8-13-85 0921	T38			4P 8WZ					X						P5								ZL 0928

EFFECTIVE DATE JUL 08 1985

PAGE 2-9

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 220

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
51	8-13-85 0918	T53			4P 1WZ				D7									X						zh 0927
51a	8-13-85 0931	T53			4P 1WZ					X						L2								zh 0939
52	8-13-85 0929	T43			4P 3WZ				D8									X						zh 0938
52a	8-13-85 0942	T43			4P 3WZ					X						E2								zh 0949
53	8-13-85 0940	T47			4P 6WZ				D9									X						zh 0949
53a	8-13-85 0953	T47			4P 6WZ					X						B5								zh 1001
54	8-13-85 0952	T40			4P 2WZ				D10									X						zh 1000
54a	8-13-85 1005	T40			4P 2WZ					X						B11								zh 1014
55	8-13-85 1004	T72			4P 5WZ				D11									X						zh 1014
55a	8-13-85 1018	T72			4P 5WZ					X						E14								zh 1027
56	8-13-85 1017	T50			4P 7WZ				D12									X						zh 1028
56a	8-13-85 1032	T50			4P 7WZ					X						L14								zh 1039

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
57	8-13-85 1042	S24			12P 52X		N12											X						zk 1049
57a	8-13-85 1054	S24			12P 52X					X							Q27							zk 1100
57b	8-13-85 1052	S16			12P 53X		M3											X						zk 1101
57c	8-13-85 1105	S16			12P 53X					X							P11							zk 1110
57d	8-13-85 1107	S31			12P 54X		C4											X						zk 1113
57e	8-13-85 1118	S31			12P 54X					X							P12							zk 1123
57f	8-13-85 1117	S07			12P 50X		D13											X						zk 1127
57g	8-13-85 1132	S07			12P 50X					X							P13							zk 1138
57h	8-13-85 1131	S53			42P 89X		K9											X						zk 1139
57i	8-13-85 1145	S53			42P 89X					X							P14							zk 1149
57j	8-13-85 1142	S70			42P 93X		J6											X						zk 1151
57k	8-13-85 1156	S70			42P 93X					X							P15							zk 1201

EFFECTIVE DATE JUL 08 1985

PAGE 221

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 222

REVISED DATE

STEP NO.	DATE AND TIME	PULL ASSY. NO.	PULL TP OR PD	PULL RCC	PULL BPRA	PULL SOURCE	FROM REACTOR CORE POS.	FROM NFS POS.	FROM SFP POS.	FROM UPENDER	FROM TP TOOL	FROM N.F.E.	FROM RCC CHANGE FIXTURE 1	FROM RCC CHANGE FIXTURE 2	FROM RCC CHANGE FIXTURE 3	INSERT IN REACTOR CORE POS.	INSERT IN SFP POS.	INSERT IN UPENDER	INSERT IN TP TOOL	INSERT IN N.F.E.	INSERT IN RCC CHANGE FIXTURE 1	INSERT IN RCC CHANGE FIXTURE 2	INSERT IN RCC CHANGE FIXTURE 3	INIT. AND TIME
57l	8-13-85 1314	S72			42P 94X		F7											X						2h 1320
57m	8-13-85 1326	S72			42P 94X					X							P16							2h 1333
57n	8-13-85 1324	S76			42P 91X		G10											X						2h 1332
57o	8-13-85 1337	S76			42P 91X					X							P17							2h 1342
57p	8-13-85 1343	T73			12P 10WZ				D13									X						2h 1349
57q	8-13-85 1353	T73			12P 10WZ					X						N12								2h 1400
58	8-13-85 1352	T57			12P 11WZ				D14									X						2h 1359
58a	8-13-85 1404	T57			12P 11WZ					X						M3								2h 1410
59	8-13-85 1402	T75			12P 16WZ				D15									X						2h 1410
59a	8-13-85 1414	T75			12P 16WZ					X						C4								2h 1421
60	8-13-85 1413	T52			12P 25WZ				D16									X						2h 1421
60a	8-13-85 1425	T52			12P 25WZ					X						D13								2h 1432

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 223

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
61	8-13-85 1424	T20			16P 11WZ				D17									X						EL 1432
61a	8-13-85 1436	T20			16P 11WZ					X						K9								EL 1443
62	8-13-85 1434	T23			16P 9WZ				D18									X						EL 1443
62a	8-13-85 1447	T23			16P 9WZ					X						J6								EL 1454
63	8-13-85 1448	T32			16P 16WZ				D19									X						EL 1454
63a	8-13-85 1459	T32			16P 16WZ					X						F7								EL 1510
64	8-13-85 1457	T22			16P 2WZ				D20									X						EL 1506
64a	8/13/85 2128	T22			16P 2WZ					X						G10								B 2137
65	8/13/85 2142	S11			42P 86X		P9											X						B 2149
65a	8/13/85 2155	S11			42P 86X					X							P18							B 2159
65b	8/13/85 2153	S14			42P 68X		P7											X						B 2201
65c	8/13/85 2208	S14			42P 68X					X							P19							B 2212

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 224

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
65d	8/13/85 2205	S09			42P 69X		J2											X						B 2214
65e	8/13/85 2219	S09			42P 69X					X							P20							B 2223
65f	8/13/85 2217	S21			42P 80X		G2											X						B 2225
65g	8/13/85 2230	S21			42P 80X					X							P21							B 2234
65h	8/13/85 2229	S04			42P 83X		B7											X						B 2236
65i	8/13/85 2242	S04			42P 83X					X							P22							B 2245
65j	8/13/85 2240	S35			42P 65X		B9											X						B 2247
65k	8/13/85 2252	S35			42P 65X					X							P23							B 2256
65l	8/13/85 2252	S28			42P 81X		G14											X						B 2258
65m	8/13/85 2303	S28			42P 81X					X							P24							B 2307
65n	8/13/85 2302	S13			42P 77X		J14											X						B 2311
65o	8/13/85 2315	S13			42P 77X					X							P25							B 2318

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
65p	8/13/85 2321	T64			16P 20WZ				D21									X						B 2325
65q	8/13/85 2329	T64			16P 20WZ					X						P9								B 2331
66	8/14/85 0041	T65			16P 21WZ				D22									X						B 0045
66a	8/14/85 0050	T65			16P 21WZ					X						P7								B 0056
67	8/14/85 0047	T70			16P 4WZ				D23									X						B 0055
67a	8/14/85 0100	T70			16P 4WZ					X						J2								B 0106
68	8/14/85 0059	T61			16P 7WZ				D24									X						B 0106
68a	8/14/85 0110	T61			16P 7WZ					X						G2								B 0116
69	8/14/85 0108	T41			16P 14WZ				D25									X						B 0115
69a	8/14/85 0119	T41			16P 14WZ					X						B7								B 0126
70	8/14/85 0117	T74			16P 1WZ				D26									X						B 0125
70a	8/14/85 0130	T74			16P 1WZ					X						B9								B 0136

EFFECTIVE DATE JUL 08 1985

PAGE 225

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
71	8/14/85 0128	T76			16P 15WZ				C3									X						B 0135
71a	8/14/85 0140	T76			16P 15WZ					X						G14								B 0147
72	8/14/85 0137	T46			16P 10WZ				C4									X						B 0146
72a	8/14/85 0151	T46			16P 10WZ					X						J14								B 0158
73	8/14/85 0201	S46			42P 87X		J10											X						B 0208
73a	8/14/85 0213	S46			42P 87X					X							P26							B 0218
73b	8/14/85 0211	S37			42P 90X		K7											X						B 0220
73c	8/14/85 0224	S37			42P 90X					X							P27							B 0229
73d	8-14-85 0747	S61			42P 88X		G6											X						2h 0753
73e	8-14-85 0801	S61			42P 88X					X							N11							2h 0806
73f	8-14-85 0757	S45			42P 92X		F9											X						2h 0807
73g	8-14-85 1230	S45			42P 92X					X							N12							2h 1235

EFFECTIVE DATE JUL 08 1985

PAGE 226

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 297

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
73h	8-14-85 1228	S19			42P 78X		M9											X						1237
73i	8-14-85 1242	S19			42P 78X					X							N13							1246
73j	8-14-85 1240	S20			42P 71X		M7											X						1248
73k	8-14-85 1253	S20			42P 71X					X							N14							1257
73l	8-14-85 1251	S23			42P 73X		J4											X						1259
73m	8-14-85 1304	S23			42P 73X					X							N15							1308
73n	8-14-85 1302	S36			42P 70X		G4											X						1310
73o	8-14-85 1315	S36			42P 70X					X							N16							1319
73p	8-14-85 1313	S05			42P 85X		D7											X						1321
73q	8-14-85 1325	S05			42P 85X					X							N17							1329
73r	8-14-85 1324	S32			42P 66X		D9											X						1331
73s	8-14-85 1337	S32			42P 66X					X							N18							1340

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
73t	8-14-85 1335	S22			42P 72X		G12											X						1342
73u	8-14-85 1350	S22			42P 72X					X							N19							1353
73u	8-14-85 1346	S01			42P 82X		J12											X						1356
73w	8-14-85 1400	S01			42P 82X					X							N20							1404
73x	8-14-85 1406	T14			12P 4WZ				C5									X						1410
73y	8-14-85 1413	T14			12P 4WZ					X						M9								1420
74	8-14-85 1412	T24			12P 12WZ				C6									X						1420
74a	8-14-85 1424	T24			12P 12WZ					X						M7								1430
75	8-14-85 1422	T09			12P 28WZ				C7									X						1431
75a	8-14-85 1436	T09			12P 28WZ					X						J4								1442
76	8-14-85 1433	T21			12P 2WZ				C8									X						1443
76a	8-14-85 1447	T21			12P 2WZ					X						G4								1453

EFFECTIVE DATE JUL 08 1985

PAGE 208

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
77	8-14-85 1446	T35			12P 7WZ				C9									X						ZL 1454
77a	8-14-85 1459	T35			12P 7WZ					X						D7								ZL 1505
78	8-14-85 1457	T31			12P 26WZ				C10									X						ZL 1505
78a	8-14-85 1510	T31			12P 26WZ					X						D9								ZL 1516
79	8-14-85 1508	T28			12P 1WZ				C11									X						ZL 1519
79a	8-14-85 1522	T28			12P 1WZ					X						G12								ZL 1528
80	8-14-85 1520	T13			12P 14WZ				C12									X						ZL 1530
80a	8-14-85 1535	T13			12P 14WZ					X						J12								ZL 1542
81	8-14-85 1533	T16			16P 8WZ				C13									X						ZL 1545
81a	8-14-85 1549	T16			16P 8WZ					X						K7								ZL 1556
82	8-14-85 1549	T36			16P 17WZ				C14									X						ZL 1557
82a	8/14/85 2139	T36			16P 17WZ					X						G6								β 2146

EFFECTIVE DATE JUL 08 1985

PAGE 299

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 238

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
83	8-14-85 2139	T07			16P 5WZ				C15									X						B 2146
83a	8/14/85 2151	T07			16P 5WZ					X						F9								B 2157
84	8/14/85 2149	T01			16P 3WZ				C16									X						B 2157
84a	8/14/85 2203	T01			16P 3WZ					X						J10								B 2209
85	8/14/85 2212	S25			42P 84X		N10											X						B 2213
85a	8/14/85 2224	S25			42P 84X					X							N21							B 2228
85b	8/14/85 2223	S02			42P 67X		N6											X						B 2230
85c	8/14/85 2236	S02			42P 67X					X							N22							B 2240
85d	8/14/85 2235	S33			12P 48X		N4											X						B 2242
85e	8/14/85 2247	S33			12P 48X					X							N23							B 2252
85f	8/14/85 2245	S10			42P 74X		K3											X						B 2253
85g	8/14/85 2258	S10			42P 74X					X							N24							B 2303

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 231

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
85h	8/14/85 2257	S27			42P 76X		F3											X						B 2305
85i	8/14/85 2309	S27			42P 76X					X							N25							B 2314
85j	8/14/85 2309	S12			12P 51X		D3											X						B 2316
85k	8/14/85 2322	S12			12P 51X					X							N26							B 2325
85l	8/14/85 2321	S29			42P 79X		C6											X						B 2327
85m	8/14/85 2332	S29			42P 79X					X							N27							B 2336
85n	8/14/85 2331	S15			42P 75X		C10											X						B 2338
85o	8/14/85 2342	S15			42P 75X					X							M11							B 2346
85p	8/15/85 0052	S26			12P 47X		C12											X						B 0058
85q	8/15/85 0104	S26			12P 47X					X							M12							B 0107
85r	8/15/85 0103	S18			42P 63X		F13											X						B 0110
85s	8/15/85 0114	S18			42P 63X					X							M13							B 0118

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
85t	8/15/85 0114	S17			42P 64X		K13											X						B 0120
85u	8/15/85 0125	S17			12P 64X					X							M14							B 0129
85v	8/15/85 0125	S06			12P 49X		M13											X						B 0133
85w	8/15/85 0137	S06			12P 49X					X							M15							B 0141
85x	8/15/85 0144	T44			16P 12WZ				C17									X						B 0149
85y	8/15/85 0153	T44			16P 12WZ					X						N10								B 0201
86	8/15/85 0152	T59			16P 13WZ				C18									X						B 0159
86a	8/15/85 0206	T59			16P 13WZ					X						N6								B 0213
87	8/15/85 0204	T60			12P 15WZ				C19									X						B 0212
87a	8/15/85 0217	T60			12P 15WZ					X						N4								B 0225
88	8-15-85 0920	T63			16P 6WZ				C20									X						2h 0926
88a	8-15-85 0929	T63			16P 6WZ					X						K3								2h 0937

EFFECTIVE DATE JUL 08 1985

PAGE 000

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
89	8-15-85 0931	T45			16P 19WZ				C21									X						ZK 0936
89a	8-15-85 0941	T45			16P 19WZ					X						F3								ZK 0948
90	8-15-85 0940	T66			12P 19WZ				C22									X						ZK 0947
90a	8-15-85 0951	T66			12P 19WZ					X						D3								ZK 0959
91	8-15-85 0951	T71			16P 22WZ				C23									X						ZK 0958
91a	8-15-85 1002	T71			16P 22WZ					X						C6								ZK 1009
92	8-15-85 1002	T69			16P 18WZ				C24									X						ZK 1009
92a	8-15-85 1014	T69			16P 18WZ					X						C10								ZK 1021
93	8-15-85 1014	T55			12P 22WZ				C25									X						ZK 1021
93a	8-15-85 1025	T55			12P 22WZ					X						C12								ZK 1032
94	8-15-85 1025	T67			16P 24WZ				C26									X						ZK 1032
94a	8-15-85 1037	T67			16P 24WZ					X						F13								ZK 1044

EFFECTIVE DATE JUL 08 1985

PAGE 233

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
95	8-15-85 1037	T37			16P 23WZ				B3									X						1040
95a	8-15-85 1040	T37			16P 23WZ					X						K13								1055
96	8-15-85 1046	T56			12P 9WZ				B4									X						1054
96a	8-15-85 1059	T56			12P 9WZ					X						M13								1106
97	8-15-85 1109	R18	7				H11											X						1116
97a	8-15-85 1120	R18	7							X							V14							1125
97b	8-15-85 1119	R50	170				H5											X						1126
97c	8-15-85 1130	R50	170							X							V15							1134
97d	8-15-85 1130	R27			12P 34X		M11											X						1137
97e	8-15-85 1142	R27			12P 34X					X							M16							1146
97f	8-15-85 1141	R68			42P 58X		M10											X						1148
97g	8-16-85 1152	R68			42P 58X					X							M17							1157

EFFECTIVE DATE JUL 08 1985

PAGE 234

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
97h	8-15-85 1318	R62			42P 59X		M6											X						2h 1324
97i	8-15-85 1330	R62			42P 59X					X							M18							2h 1335
97j	8-15-85 1327	R54			12P 23X		M5											X						2h 1336
97k	8-15-85 1341	R54			12P 23X					X							M19							2h 1344
97l	8-15-85 1413	R13			12P 31X		L4											X						2h 1419
97m	8-15-85 1424	R13			12P 31X					X							M20							2h 1428
97n	8-15-85 1422	R48			42P 55X		K4											X						2h 1430
97o	8-15-85 1434	R48			42P 55X					X							M21							2h 1438
97p	8-15-85 1433	R33			42P 60X		F4											X						2h 1440
97q	8-15-85 1444	R33			42P 60X					X							M22							2h 1449
97r	8-15-85 1444	R01			12P 26X		E4											X						2h 1450
97s	8-15-85 1454	R01			12P 26X					X							M23							2h 1458

EFFECTIVE DATE JUL 08 1985

PAGE 235

REVISED DATE

TPC 85-120-OP FANDR 17

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 236

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
97t	8-15-85 1454	R64			12P 27X		D5											X						ah 1504
97u	8-15-85 1508	R64			12P 27X					X							M24							ah 1513
97v	8-15-85 1507	R51			42P 56X		D6											X						ah 1514
97w	8-15-85 1519	R51			42P 56X					X							M25							ah 1522
97x	8-15-85 1518	R02			42P 61X		D10											X						ah 1524
97y	8-15-85 1529	R02			42P 61X					X							M26							ah 1533
97z	8-15-85 1528	R72			12P 38X		D11											X						ah 1535
97aa	8-15-85 1539	R72			12P 38X					X							M27							ah 1543
97bb	8-15-85 1539	R61			12P 29X		E12											X						ah 1545
97cc	8-15-85 1550	R61			12P 29X					X							L11							ah 1553
97dd	8-15-85 1549	R05			42P 57X		F12											X						ah 1557
97ee	8-15-85 1602	R05			42P 57X					X							L12							ah 1605

FAHDR 78

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 237

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
97ff	8-15-85 1600	R24			42P 62X		K12											X						ah 1608
97gg	8-15-85 1612	R24			42P 62X					X							L13							ah 1616
97hh	8-15-85 1611	R26			12P 42X		L12											X						ah 1618
97ii	8-15-85 1622	R26			12P 42X					X							L14							ah 1625
97jj	8-15-85 1626	T08			12P 27WZ				B5									X						β 1631
97kk	8/15/85 1635	T08			12P 27WZ					X						H11								β 1641
98	8/15/85 1632	T30			12P 20WZ				B6									X						β 1641
98a	8/15/85 1645	T30			12P 20WZ					X						H5								β 1651
							END OF PHASE I																	

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

JJ	HH	GG	FF	EE	DD	CC	BB	AA	Z	Y	X	W	V	U	T	S	
																	1
																	2
																	3
																	4
																	5
																	6
																	7
																	8
																	9
	B55	B09	B42	203 B37	20 B38	B35	18 B59	252 P57	241 P48	C23	C09	219 C32	209 R69				10
143 B64	12P11X C10	16P47 C28	16P42 B63	133 B25	139 B34	B62	12P28X B45	240 P44	165 C16	P14	16P44 C64	226 C60	237 R44				11
156 B50	12P7X C39	16P41 B51	20P11 C07	A9P4 B46	175 B27	12P36X B10	12P21X B16	SPS11 C59	162 C57	16P64 C22	A9P3 C42	243 C50	8 R29				12
177 B24	12P6X B02	16P50 B48	17 B32	A9P1 B52	B44	12P9X B23	12P19X B22	166 C46	204 C12	P24	16P56 C02	183 C54	190 R12				13
C13	12P18X B13	247 B19	144 B43	16P46 B07	12P44X C27 *	12P3X B29	225 B41	161 C05	248 P32	A9P6 C24	12P17X C53	173 R76	7 R18				14
B04	20P23 C55	16P63 B47	20P29 B57	16P52 B17	B40	12P37X B11	157 B14	140 C63	251 P07	P34	20P21 C20	6 R14	170 R50				15
B49	20P1 B54	16P61 B31	20P3 B18	20P16 B20	146 B56	154 B30	191 C61	155 C19	228 P41	20P10 C26	239 C11	152 R20					16
150 B03	148 B06	20P17 B01	16P59 C29	12P64X B08	213 B05	136 B60	164 B33	160 C47	12 P35	P16	181 C17	238 R75					17
B39	19 B36	16P49 B26	20P6 B21	16P60 B53	12P44X C31 *	147 B12	12P35X B15	SPS12 C15	194 P37	12P12X C37	232 A24	221 P36					18
12P1X A52	12P10X A34	16P53 A39	178 B58	176 B61	171 C03	188 C01	163 B28	158 C36	203 P58	20P12 C43	186 C35	145 P08					19
20P24 A06	16P35 A30	16P48 A21	B8P2 A32	A8P2 A20	B8P3 A13	A8P4 A53	16P51 A56	196 P49	C34	C38	20P14 C41	135 P51					20

SPENT FUEL PIT AFTER END OF PHASE ONE
SHEET 1 OF 4

* BPRA 12P44X parts located in F.A.'s C27 & C31

R	Q	P	N	M	L	K	J	H	G	F	E	D	C	B	A	
																1
																2
																3
																4
											SS15 T04					5
																6
																7
											SS14 T03					8
																9
																10
	12P43X S51	12P53X S16	42P88X S61	42P75X S15	12P29X R61											11
	12P41X S54	12P54X S31	42P92X S45	12P47X S26	42P57X R05											12
	12P33X S68	12P50X S07	42P78X S19	42P63X S18	42P62X R24											13
	12P45X S58	42P89X S53	42P71X S20	42P64X S17	12P42X R26											14
	12P25X S42	42P93X S70	42P73X S23	12P49X S06												15
	12P30X S47	42P94X S72	42P70X S36	12P34X R27												16
	12P32X S62	42P91X S76	42P85X S05	42P58X R68												17
	12P24X S49	42P86X S11	42P66X S32	42P59X R62												18
	C8P7 S38	42P68X S14	42P72X S22	12P23X R54												19
	C8P4 S73	42P69X S09	42P82X S01	12P31X R13												20

SPENT FUEL PIT AFTER END OF PHASE ONE
SHEET 2 OF 4

JJ	HH	GG	FF	EE	DD	CC	BB	AA	Z	Y	X	W	V	U	T	S	
R523 A51	B9P6 A37	12P15X A60	20P22 A55	AP52 A54	R524 A45	R527 A64	R526 A59	229 P38	P17	197 P18	C40	244 P29					21
12P2X A27	12P13X A61	RS25 A63	12P14X A31	20P8 A02	R528 A43	R522 A38	12P5X A35	208 P28	C04	132 C58	C45	195 R67					22
A8P3 A03	20P20 A16	20P30 A46	20P4 A33	20P9 A48	20P18 A49	20P19 A50	12P9X A26	234 P06	C14	192 C44	242 C21	137 R39					23
B8P1 A28	20P28 A08	16P62 A17	20P26 A36	B8P4 A04	BP52 A07	20P5 A15	20P15 A63	202 P62	C09	212 C52	C18	149 R15					24
	20P25 A47	16P54 A01	16P45 A29	A8P1 A14	20P2 A41	16P43 A23	20P27 A62	P26	C33	200 C30	09 C06	10 R73					25
	B9P2 A57	20P7 A12	B9P3 A18	A9P2 A05	12P16X A09	16P57 A11	B9P4 A25	P42	C56	C62	232 C25	189 R28					26
ISB	R521 A44	20P13 A58	B9P1 A42	B9P5 A22	16P58 A40	A9P5 A10	12P4X A19	P31	C49	C48	159 C51	218 R63					27
																	28
																	29
																	30
																	31
																	32
																	33
																	34
																	35

SPENT FUEL PIT AFTER END OF PHASE ONE
SHEET 3 OF 4

R	Q	P	N	M	L	K	J	H	G	F	E	D	C	B	A	
	C8P5 S57	42P80X S21	42P84X S25	42P55X R49												21
	C8P1 S66	42P83X S04	42P67X S02	42P60X R33												22
	C8P3 S40	42P65X S35	12P48X S33	12P26X R01												23
	C8P9 S75	42P81X S28	42P74X S10	12P27X R64												24
	C8P2 S52	42P77X S13	42P76X S27	42P56X R51												25
	C8P6 S56	42P87X S46	12P51X S12	42P61X R02												26
	12P52X S24	42P90X S37	42P79X S29	12P38X R72												27
																28
																29
																30
																31
																32
														DF4 P/LACC		33
																34
																35

SPENT FUEL PIT AFTER END OF PHASE ONE
SHEET 4 OF 4

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 942

REVISED DATE

PHASE II INSERT CHANGEOUTS

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
1	8/14/85 1745		237						V11								X10							B 1748
2	8/14/85 1750		226						W11								Y10							B 1752
3	8/14/85 1754		165						Z11								CC10							B 1755
4	8/14/85 1757		139						DD11								FF10							B 1759
5	8/14/85 1800		133						EE11								GG10							B 1804
6	8/14/85 1820		175						DD12								HH10							B 1822
7	8/14/85 1824		144						FF14								JJ14							B 1826
8	8/14/85 1825		247						GG14								JJ15							B 1830
9	8/14/85 1832		148						HH17								JJ16							B 1820
10	8/14/85 1823		19						HH18								JJ18							B 1526
11	8/14/85 2110				12P 43X				Q11								EE11							B 2118
12	8/15/86 1741				12P 53X				P11								DD11							1741

FANDA # 1415

FANDA # 1516

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
13	8/15/85 1751				12P 41X				Q12								CC11							[illegible] 1755
14	8/15/85 1758				12P 54X				P12								Z11							[illegible] 1802
15	8/15/85 1806				12P 33X				Q13								Y11							[illegible] 1811
16	8/15/85 1813				12P 50X				P13								W11							[illegible] 1826
17	8/15/85 1836				12P 45X				Q14								V11							[illegible] 1833
18	8/15/85 1836				42P 89X				P14								DD12							[illegible] 1840
19	8/15/85 1843				12P 25X				Q15								DD13							[illegible] 1847
20	8/15/85 1850				12P 30X				Q16								Y13							[illegible] 1854
21	8/15/85 1857				42P 94X				P16								GG14							[illegible] 1902
22	8/15/85 1904				12P 32X				Q17								FF14							[illegible] 1908
23	8/15/85 1911				12P 24X				Q18								DD15							[illegible] 1914
24	8/15/85 1916				C8 P7				Q19								Z20							[illegible] 1918

EFFECTIVE DATE JUL 08 1985

PAGE 243

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
25	8/15/85 1921				C8 P4				Q20								Y20							1925
26	8/15/85 1927				C8 P5				Q21								Z21							1931
27	8/15/85 1933				C8 P1				Q22								Z22							1938
28	8/15/85 1940				C8 P3				Q23								Z23							1943
29	8/15/85 1945				C8 P8				Q24								Z24							1948
30	8/15/85 1952				C8 P2				Q25								AA25							1955
31	8/15/85 1959				C8 P6				Q26								AA26							2002
32	8/15/85 2004				12P 52X				Q27								AA27							2008
33	8/15/85 2010				12P 38X				M27								Z27							2018
34	8/15/85 2021				42P 61X				M26								Y27							2023
35	8/15/85 2026				42P 56X				M25								Z26							2050
36	8/15/85 2032				12P 27X				M24								Y26							2036

EFFECTIVE DATE JUL 08 1985

PAGE 244

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
37	8/15/85 2040				12P 26X				M23								Z25							HDP 2043
38	8/15/85 2045				42P 60X				M22								X24							HDP 2047
39	8/15/85 2049				42P 55X				M21								X22							HDP 2053
40	8/15/85 2055				12P 31X				M20								X21							HDP 2058
41	8/15/85 2101				12P 23X				M19								HH18							HDP 2105
42	8/15/85 2109				42P 59X				M18								HH17							HDP 2113
43	8/15/85 2115				42P 58X				M17								Y17							HDP 2118
44	8/15/85 2123				12P 34X				M16								Y15							HDP 2126
45	8/15/85 2249		240						AA11								P11							2251
46	8/15/85 2253		162						Z12								Q11							2255
47	8/15/85 2258		243						W12								Q12							2300
48	8/15/85 2302		8						V12								P12							5303

EFFECTIVE DATE JUL 08 1985

PAGE 245

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 246

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
49	8/15/85 2306		183						W13								Q13							2308
50	8/15/85 2310		190						V13								P13							2312
51	8/15/85 2314		173						W14								Q14							2315
52	8/15/85 2317		7						V14								P14							2319
53	8/15/85 2321		170						V15								Q15							2323
54	8/15/85 2325		6						W15								M16							2327
55	8/15/85 2329		251						Z15								P16							2331
56	8/15/85 2333		152						W16								Q16							2334
57	8/15/85 2337		238						W17								M17							2338
58	8/15/85 2340		181						X17								Q17							2341
59	8/15/85 2343		221						W18								M18							2349
60	8/15/85 2351		222						X18								Q18							2353

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
61	8/15/85 2355		145						W19								M19							2356
62	8/16/85 2359		186						X19								Q19							0000
63	8/16/85 0002		135						W20								M20							0004
64	8/16/85 0006		196						AA20								Q20							0007
65	8/16/85 0009		244						W21								M21							0010
66	8/16/85 0012		197						Y21								Q21							0014
67	8/16/85 0016		195						W22								M22							0017
68	8/16/85 0019		132						Y22								Q22							0020
69	8/16/85 0022		137						W23								M23							0024
70	8/16/85 0025		192						Y23								Q23							0027
71	8/16/85 0028		149						W24								M24							0030
72	8/16/85 0032		212						Y24								Q24							0033

EFFECTIVE DATE JUL 08 1985

PAGE 247

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
73	8/16/85 0038		10						W25								M25							0041
74	8/16/85 0043		9						X25								Q25							0045
75	8/16/85 0047		189						W26								M26							0051
76	8/16/85 0054		232						X26								Q26							0057
77	8/16/85 0059		218						W27								M27							0102
78	8/16/85 0104		159						X27								Q27							0107
79	8/16/85 0123				42P 90X				P27								X27							0126
80	8/16/85 0130				42P 79X				N27								W27							0138
81	8/16/85 0135				42P 87X				P26								X26							0143
82	8-16-85 0756				12P 51X				N26								W26							0759
83	8-16-85 0801				42P 77X				P25								X25							0804
84	8-16-85 0807				42P 76X				N25								W25							0810

EFFECTIVE DATE JUL 08 1985

PAGE 248

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
85	8-16-85 0812				42P 81X				P24								Y24							zl 0815
86	8-16-85 0817				42P 74X				N24								W24							ap 0925
87	8-16-85 1512				42P 65X				P23								Y23							zl 1514
88	8-16-85 1516				12P 48X				N23								W23							zl 1519
89	8-16-85 1521				42P 83X				P22								Y22							zl 1524
90	8-16-85 1526				42P 67X				N22								W22							zl 1529
91	8-16-85 1534				42P 80X				P21								Y21							zl 1537
92	8-16-85 1539				42P 84X				N21								W21							zl 1542
93	8-16-85 1544				42P 69X				P20								AA20							zl 1547
94	8-16-85 1550				42P 82X				N20								W20							zl 1552
95	8-16-85 1555				42P 68X				P19								X19							zl 1557
96	8-16-85 1559				42P 72X				N19								W19							zl 1603

EFFECTIVE DATE JUL 08 1985

PAGE 249

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
97	8-16-85 1606				42P 86X				P18								X18							ZL 1609
98	8-16-85 1612				42P 66X				N18								W18							ZL 1616
99	8-16-85 1619				42P 91X				P17								X17							ZL 1623
100	8-16-85 1625				42P 85X				N17								W17							ZL 1629
101	8-16-85 1632				42P 70X				N16								W16							ZL 1637
102	8-16-85 1640				42P 93X				P15								Z15							ZL 1646
103	8-16-85 1650				42P 73X				N15								W15							HOP 1656
104	8-16-85 1700				12P 49X				M15								V15							HOP 1705
105	8/16/85 1710				42P 71X				N14								W14							HOP 1713
106	8/16/85 1714				42P 64X				M14								V14							HOP 1717
107	8/16/85 1719				42P 78X				N13								W13							HOP 1727
108	8/16/85 1729				42P 63X				M13								V13							HOP 1732

EFFECTIVE DATE JUL 08 1985

PAGE 250

REVISED DATE

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 251

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
109	8/16/85 1734				12P 42X				L14								Z12							~~HOT~~ 1737
110	8/16/85 1740				42P 62X				L13								W12							~~HOT~~ 1746
111	8/16/85 1749				42P 57X				L12								V12							~~HOT~~ 1752
112	8/16/85 1755				12P 29X				L11								AA11							~~HOT~~ 1800
113	8/16/85 1812		166						AA13								L11							~~HOT~~ 1817
114	8/16/85 1821		161						AA14								L12							~~HOT~~ 1823
115	8/16/85 1825		140						AA 15								L13							~~HOT~~ 1829
116	8/16/85 1831		155						AA16								L14							~~HOT~~ 1835
117	8/16/85 1844				42P 92X				N12								AA16							~~HOT~~ 1848
118	8/16/85 1851				12P 47X				M12								AA15							~~HOT~~ 1854
119	8/16/85 1856				42P 88X				N11								AA14							~~HOT~~ 1858
120	8/16/85 1859				42P 75X				M11								AA13							~~HOT~~ 1902
							END OF PHASE II																	

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

8/10/85 G.E.
TPC 85-115 OPS

JJ	HH	GG	FF	EE	DD	CC	BB	AA	Z	Y	X	W	V	U	T	S	
																	1
																	2
																	3
																	4
																	5
																	6
																	7
																	8
																	9
	175 B55	133 B09	139 B42	203 B37	20 B38	165 B35	18 B59	252 P57	241 P48	226 C23	237 C08	219 C32	209 R69				10
143 B64	12P11X C10	16P47 C28	16P42 B63	12P43X B25	12P53X B34	12P41X B62	12P28X B45	12P29X P44	12P54X C16	12P33X P14	16P44 C64	12P50X C60	12P45X R44				11
156 B50	12P7X C39	16P41 B51	20P11 C07	A9P4 B46	42P89X B27	12P36X B10	12P21X B16	SPS11 C59	12P42X C57	16P64 C22	A9P3 C42	42P62X C50	42P57X R29				12
177 B24	12P6X B02	16P50 B48	17 B32	A9P1 B52	12P25X B44	12P9X B23	12P19X B22	42P75X C46	204 C12	12P30X P24	16P56 C02	42P78X C54	42P63X R12				13
144 C13	12P18X B13	42P94X B19	12P32X B43	16P46 B07	12P44X C27 *	12P3X B29	225 B41	42P88X C05	248 P32	A9P6 C24	12P17X C53	42P71X R76	42P64X R18				14
247 B04	20P23 C55	16P63 B47	20P29 ~~16P52~~ 20P16 B17	12P24X B40	12P37X B11	157 B14	42P47X C63	42P93X P07	12P34X P34	20P21 C20	42P73X R14	12P49X R50					15
148 B49	20P1 B54	16P61 B31	20P3 B18	~~20P16~~ 16P52 B20	146 B56	154 B30	191 C61	42P92X C19	228 P41	20P10 C26	239 C11	42P70X R20					16
150 B03	42P59X B06	20P17 B01	16P59 C29	12P~~64~~44X B09	213 B05	136 B60	164 B33	160 C47	12 P35	42P58X P16	42P91X C17	42P85X R75					17
19 B39	12P23X B36	16P49 B26	20P6 B21	16P60 B53	~~42P44X~~ C31	147 B12	12P35X B15	SPS12 C15	194 P37	12P12X C37	42P86X C24	42P66X P36					18
12P1X A52	12P10X A34	16P53 A39	178 B58	176 B61	171 C03	188 C01	163 B28	158 C36	205 P58	20P12 C43	42P68X C35	42P72X P08					19
20P24 A06	16P55 A30	16P48 A21	8BP2 A32	A8P2 A20	8BP3 A13	A8P4 A53	16P51 A56	42P69X P49	C8P7 C34	C8P4 C38	20P14 C41	42P82X P51					20

SPENT FUEL PIT AFTER END OF PHASE TWO
SHEET 1 OF 4

* BPRA 12P44X parts located in F.A.'s C27 & ~~C37~~ C.E.

R	Q	P	N	M	L	K	J	H	G	F	E	D	C	B	A	
																1
																2
																3
																4
											SS15 T04					5
																6
																7
											SS14 T03					8
																9
																10
	162 S51	240 S16	S61	S15	166 R61											11
	243 S54	8 S31	S45	S26	161 R05											12
	183 S68	190 S07	S19	S18	140 R24											13
	173 S58	7 S53	S20	S17	155 R26											14
	170 S42	S70	S23	S06												15
	152 S47	251 S72	S36	6 R27												16
	181 S62	S76	S05	238 R68												17
	222 S49	S11	S32	221 R62												18
	186 S38	S14	S22	145 R54												19
	196 S73	S09	S01	135 R13												20

SPENT FUEL PIT AFTER END OF PHASE TWO
SHEET 2 OF 4

JJ	HH	GG	FF	EE	DD	CC	BB	AA	Z	Y	X	W	V	U	T	S	
~~R523~~ 523 A51	B9P6 A37	12P15X A60	20P22 A55	AP~~52~~ 52 A54	~~R524~~ 524 A45	~~R527~~ 527 A64	~~R526~~ 526 A59	229 P38	C8P5 P17	42P80X P19	12P31X C40	42P84X F29					21
12P2X A27	12P13X A61	R525 A63	12P14X A31	20P8 A02	~~R528~~ 528 A43	~~R522~~ 522 A38	12P5X A35	209 P28	C8P1 C04	42P93X C58	42P55X C45	42P67X R67					22
A8P3 A03	20P20 A16	20P30 A46	20P4 A33	20P9 A48	20P18 A49	20P19 A50	12P8X A26	234 P06	C8P3 C14	42P65X C44	242 C21	12P48X R39					23
B8P1 A29	20P28 A08	16P62 A17	20P26 A36	B8P4 A04	BP~~52~~ 52 A07	20P5 A15	20P15 A65	202 P62	C8P8 C09	42P81X C52	42P60X C18	42P74X R15					24
	20P25 A47	16P54 A01	16P45 A29	A8P1 A14	20P2 A41	16P43 A23	20P27 A62	C8P2 P26	12P26X C33	200 C30	42P77X C06	42P76X R73					25
	B9P2 A57	20P7 A12	B9P3 A18	A9P2 A05	12P16X A09	16P57 A11	B9P4 A25	C8P6 P42	42P56X C56	12P27X C62	42P87X C25	12P51X R28					26
ISB	~~R521~~ 521 A44	20P13 A58	B9P1 A42	B9P5 A22	16P58 A40	A9P5 A10	12P4X A19	12P52X P31	12P38X C49	42P61X C48	42P90X C51	42P79X R63					27
																	28
																	29
																	30
																	31
																	32
																	33
																	34
																	35

8/10/85
TPC 85-115
A.E.

SPENT FUEL PIT AFTER END OF PHASE TWO
SHEET 3 OF 4

R	Q	P	N	M	L	K	J	H	G	F	E	D	C	B	A	
	197 S57	S21	S25	244 R48												21
	132 S66	S04	S02	195 R33												22
	192 S40	S35	S33	137 R01												23
	212 S75	S29	S10	149 R64												24
	9 S52	S13	S27	10 R51												25
	232 S56	S46	S12	189 R02												26
	159 S24	S37	S29	218 R72												27
																28
																29
																30
																31
														DFA		32
														DFA ~~[illegible]~~	R114	33
																34
																35

SPENT FUEL PIT AFTER END OF PHASE TWO
SHEET 4 OF 4

TPC 85-115 OPS
8/10/85
G.E.

BEGIN PHASE III

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
99	8/16/85 2007	S56	232						Q26									X						JWP 2015
99a	8/16/85 2023	S56	232							X						M11								JWP 2032
100	8/16/85 2019	R02	189						M26									X						JWP 2029
100a	8/16/85 2036	R02	189							X						M10								JWP 2054
101	8/16/85 2033	R51	10						M25									X						JWP 2042
101a	8/16/85 2058	R51	10							X						M6								JWP 2105
102	8/16/85 2044	S57	197						Q21									X						JWP 2104
102a	8/16/85 2109	S57	197							X						M5								JWP 2116
103	8/16/85 2107	R24	140						L13									X						JWP 2115
103a	8/16/85 2119	R24	140							X						K4								JWP 2126
104	8/16/85 2117	R05	161						L12									X						JWP 2125
104a	8/16/85 2129	R05	161							X						F4								JWP 2138

EFFECTIVE DATE JUL 08 1985

PAGE 256

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
105	8/16/85 2128	S40	192						Q23									X						JWP 2135
105a	8/16/85 2141	S40	192							X						E4								JWP 2148
106	8/16/85 2139	S66	132						Q22									X						JWP 2147
106a	8/16/85 2152	S66	132							X						D5								JWP 2158
107	8/16/85 2149	R62	221						M18									X						JWP 2158
107a	8/16/85 2202	R62	221							X						D6								JWP 2208
108	8/16/85 2200	R68	238						M17									X						JWP 2209
108a	8/16/85 2213	R68	238							X						D10								JWP 2220
109	8/16/85 2210	S52	9						Q25									X						JWP 2221
109a	8/16/85 2225	S52	9							X						D11								JWP 2233
110	8/16/85 2223	R33	195						M22									X						JWP 2233
110a	8/16/85 2237	R33	195							X						F12								JWP 2243

EFFECTIVE DATE JUL 08 1985

PAGE 257

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
111	8/16/85 2235	R48	244						M21									X						JNP 2242
111a	8/16/85 2247	R48	244							X						K12								JNP 2255
112	8/16/85 2244	S38	186						Q19									X						JNP 2253
112a	~~8/16/85~~ 8/16/85 2258	S38	186							X						L12								JNP 2305
113	8/17/85 0027	S73	196						Q20									X						JNP 0030
113a	8/17/85 0035	S73	196							X												X		JNP 0039
113b	8/17/85 0045		196											X					X					XXXXX
113c	8/17/85 0036	T03				SS14			E8									X						JNP 0041
113d	8/17/85 0048	T03				SS14				X											X			JNP 0051
113e	8/17/85 0053					SS14							X									X		JNP 0056
113f	8/17/85 0057	T03											X					X						JNP 0101
113g	8/17/85 0109	S73				SS14								X		L4								JNP 0116

EFFECTIVE DATE JUL 08 1985

PAGE 259

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 259

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
114	8/17/85 0107	T03								X										X				HNP 0112
114a	8/17/86 0114	S70							P15									X						HNP 0117
114b	8/17/85 0130	S70								X												X		HNP 0135
114c	8/17/85 0121	R03				SS11	H3														X			HNP 0128
114d	8/17/85 0136					SS11							X									X		HNP 0145
114e	8/17/85 0149	S70				SS11								X		H3								HNP 0157
115	8/17/85 0120		1Z					Box												X				HNP 0121
115a	8/17/85 0126	T03	1Z									X						X						HNP 0137
115b	8/17/84 0216	P11		R94			H8															X		HNP 0223
115c	8/17/84 0225			R94										X							X			HNP 0228
115d	8/17/85 0202	T03	1Z							X						R10								HNP 0213
116	XXXXXX		196								X											X		HNP 0230

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 260

REVISED DATE

FAHR 19

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
116a	8/17/85 0232	P11	196											X				X						HP 0237
116b	8/17/85 0245	P11	196							X							V16							HP 0248
116c	8/17/85 0238	R03		R94									X			H8								HP 0245
117	8-17-85 0754	S75	212						Q24									X						zh 0802
117a	8-17-85 0808	S75	212							X												X		zh 0813
117b	8-17-85 0816		212											X					X					XXXXX
117c	8-17-85 0804	T04				SS15			E5									X						zh 0814
117d	8-17-85 0819	T04				SS15				X											X			zh 0822
117e	8-17-85 0824					SS15							X									X		zh 0841
117f	8-17-85 0849	T04											X					X						zh 0853
117g	8-17-85 0856	S75				SS15								X		E12								zh 0903
118	8-17-85 0901	T04								X										X				zh 0909

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
118a	8-17-85 0912	S76							P17									X						0918
118b	8-17-85 0924	S76								X												X		0928
118c	8-17-85 0912	R34				SPS 13	H13														X			0919
118d	8-17-85 0930					SPS 13							X									X		0934
118e	8-17-85 0935	S76				SPS 13								X		H13								0942
119	8-17-85 0923		2Z					Box												X				0924
119a	8-17-85 0927	T04	2Z									X						X						0934
119b	8-17-85 0952	P54		R85			M4															X		0958
119c	8-17-85 1000	T04	2Z							X						A10								1007
120	XXXXXX		212								X										X			1012
120a	8-17-85 1013	R34	212										X					X						1017
120b	8-17-85 1022	R34	212							X							V17							1028

EFFECTIVE DATE JUL 08 1985

PAGE 261

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
120c	8-17-85 1030	S37							P27									X						zh 1035
120d	8-17-85 1040	S37								X											X			zh 1043
120e	8-17-85 1045			R85										X							X			zh 1048
120f	8-17-85 1055	S37		R85									X			M4								zh 1102
121	8-17-85 1049	P54												X				X						zh 1053
121a	8-17-85 1057	P54								X							V18							zh 1103
121b	8-17-85 1105	S61							N11									X						zh 1109
121c	8-17-85 1114	S61								X												X		zh 1117
121d	8-17-85 1105	P60		R107			D4														X			zh 1111
121e	8-17-85 1119			R107									X									X		zh 1122
121f	8-17-85 1123	P60											X					X						zh 1127
121g	8-17-85 1131	P60								X							V19							zh 1136
121h	8-17-85 1128	S61		R107										X		D4								zh 1135

EFFECTIVE DATE JUL 08 1985

PAGE 262

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
122	8-17-85 1314	S45							N12									X						1319
122a	8-17-85 1323	S45								X												X		1326
122b	8-17-85 1310	P52		R95			D12														X			1317
122c	8-17-85 1328			R95									X									X		1331
122d	8-17-85 1332	P52											X					X						1336
122e	8-17-85 1341	P52								X							V20							1346
122f	8-17-85 1338	S45		R95										X		D12								1345
123	8-17-85 1347	S46							P26									X						1352
123a	8-17-85 1358	S46								X												X		1402
123b	8-17-85 1350	P46		R74			M12														X			1357
123c	8-17-85 1404			R74									X									X		1406
123d	8-17-85 1407	P46											X					X						1410
123e	8-17-85 1416	P46								X							V21							1421

EFFECTIVE DATE JUL 08 1985

PAGE 263

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
123f	8-17-85 1412	S46		R74										X		M12								1422
124	8-17-85 1422	S02							N22									X						1426
124a	8-17-85 1434	S02								X												X		1438
124b	8-17-85 1425	P05		R77			N9														X			1433
124c	8-17-85 1439			R77									X									X		1442
124d	8-17-85 1443	P05											X					X						1446
124e	8-17-85 1451	P05								X							V22							1456
124f	8-17-85 1448	S02		R77										X		N9								1455
125	8-17-85 1457	S25							N21									X						1502
125a	8-17-85 1506	S25								X												X		1510
125b	8-17-85 1458	P59		R75			N7														X			1504
125c	8-17-85 1511			R75									X									X		1514
125d	8-17-85 1514	P59											X					X						1518

EFFECTIVE DATE JUL 08 1985

PAGE 264

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
125e	8-17-85 1523	P59								X							V23							a.e. 1529
125f	8-17-85 1520	S25		R75										X		N7								a.e. 1527
126	8-17-85 1530	S06							M15									X						[illegible] 1537
126a	8-17-85 1542	S06								X												X		[illegible] 1545
126b	8-17-85 1530	R60		R91			M8														X			[illegible] 1537
126c	8-17-85 1546			R91									X									X		[illegible] 1549
126d	8-17-85 1550	R60											X					X						[illegible] 1553
126e	8-17-85 1601	R60								X							V24							[illegible] 1605
126f	8-17-85 1557	S06		R91										X		M8								[illegible] 1604
127	8-17-85 1606	S27							N25									X						[illegible] 1613
127a	8-17-85 1617	S27								X												X		[illegible] 1621
127b	8-17-85 1607	P50		R110			J3														X			[illegible] 1614
127c	8-17-85 1622			R110									X									X		[illegible] 1625

EFFECTIVE DATE JUL 08 1985

PAGE 265

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
127d	8-17-85 1625	P50											X					X						ZL 1629
127e	8/17/85 1635	P50								X							V25							B 1640
127f	8-17-85 1633	S27		R110										X		J3								B 1609
128	8/17/85 1641	S10							N24									X						B 1645
128a	8/17/85 1653	S10								X												X		B 1657
128b	8/17/85 1642	P15		R63			G3														X			B 1648
128c	8/17/85 1659			R63									X									X		B 1702
128d	8/17/85 1703	P15											X					X						B 1706
128e	8/17/85 1712	P15								X							V26							B 1716
128f	8/17/85 1708	S10		R63										X		G3								B 1715
129	8/17/85 1718	S33							N23									X						B 1721
129a	8/17/85 1728	S33								X												X		B 1739
129b	8/17/85 1718	R30		R92			H4														X			B 1726

EFFECTIVE DATE JUL 08 1985

PAGE 265

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
129c	8/17/85 1735			R92									X									X		β 1738
129d	8/17/85 1740	R30											X					X						β 1744
129e	8/17/85 1749	R30								X							V27							β 1753
129f	8/17/85 1747	S33		R92										X		H4								β 1754
130	8/17/85 1755	S15							M11									X						β 1758
130a	8/17/85 1806	S15								X												X		β 1810
130b	8/17/85 1758	P40		R102			C7														X			β 1804
130c	8/17/85 1812			R102									X									X		β 1816
130d	8/17/85 1818	P40											X					X						β 1823
130e	8/17/85 1829	P40								X							U10							β 1832
130f	8/17/85 1826	S15		R102										X		C7								β 1833
131	8/17/85 1833	S29							N27									X						β 1837
131a	8/17/85 1845	S29								X												X		β 1845

EFFECTIVE DATE JUL 08 1985

PAGE 267

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
131b	8/17/85 1836	P23		R112			C9														X			B 1843
131c	8/17/85 1851			R112									X									X		B 1855
131d	8/17/85 1857	P23											X					X						B 1901
131e	8/17/85 1905	P23								X							U11							B 1908
131f	8/17/85 1903	S29		R 112										X		C9								B 1909
132	8/17/85 1910	S12							N26									X						B 1913
132a	8/17/85 1921	S12								X												X		B 1925
132b	8/17/85 1912	R19		R88			D8														X			B 1919
132c	8/17/85 1928			R88									X									X		B 1931
132d	8/17/85 1933	R19											X					X						B 1936
132e	8/17/85 1941	R19								X							U12							B 1945
132f	8/17/85 1938	S12		R88										X		D8								B 1947
133	8/17/85 1948	S17							M14									X						B 1950

EFFECTIVE DATE JUL 08 1985

PAGE 268

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE · PROPRIETARY

EFFECTIVE DATE JUL 08 1985

PAGE 269

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
133a	8/17/85 1958	S17								X												X		B 2003
133b	8/17/85 1950	P20		R105			G13														X			B 1957
133c	8/17/85 2005 ~~1958~~			R105									X									X		B 2008
133d	8/17/85 2010	P20											X					X						B 2015
133e	8/17/85 2020	P20								X							U13							B 2024
133f	8/17/85 2020	S17		R105										X		G13								B 2031
134	8/17/85 2025	S18							M13									X						B 2028
134a	8/17/85 2053	S18								X												X		B 2059
134b	8/17/85 2036	P64		R111			J13														X			B 2050
134c	8/17/85 2102			R111									X									X		JMK 2105
134d	8-17-85 2107	P64											X					X						JMK 2119
134e	8-17-85 2121	P64								X							U14							JMK 2124
134f	8-17-85 2119	S18		R111										X		J13								JMK 2131

FAHDR #26

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 270

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
135	8-17-85 2126	S26							M12									X						JMK 2130
135a	8-17-85 2148	S26								X												X		JMK 2154
135b	8-17-85 2136	R49		R100			H12														X			JMK 2140
135c	8-17-85 2157			R100									X									X		JMK 2201
135d	8-17-85 2202	R49											X					X						JMK 2205
135e	8-17-85 2210	R49								X							U15							JMK 2213
135f	8-17-85 2208	S26		R100										X		H12								JMK 2221 FAHDR 21
136	8/18/85 0007	S68	183						Q13									X						B 0010
136a	8/18/85 0011	R58	193				H9															X		B 0020 FAHDR #22
136b	8/18/85 0022	S68	183							X						H9								B 0030
137	8/18/85 0033	P39		R61			K10														X			B 0041
137a	8/18/85 0046		193											X					X					XXXXXX
137b	8/18/85 0047			R61									X									X		B 0050

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 271

REVISED DATE

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
137c	XXXXXX		193								X										X			B 0052
137d	8/18/85 0054	P39	193										X					X						B 0059
137e	8/18/85 0104	P39	193							X							U16							B 0109
137f	8/18/85 0102	R58		R61										X		K10								B 0110
138	8/18/85 0111	S42	170						Q15									X						B 0114
138a	8/18/85 0113	R56	172				J8															X		B 0120
138b	8/18/85 0122	S42	170							X						J8								B 0129
139	8/18/85 0132	P43		R84			K6														X			B 0139
139a	8/18/85 0141		172											X					X					XXXXX
139b	8/18/85 0145			R84									X									X		B 0148
139c	XXXXXX		172								X										X			B 0149
139d	8/18/85 0151	P43	172										X					X						B 0155
139e	8/18/85 0200	P43	172							X							U17							B 0203

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
139f	8/18/85 0157	R56		R84										X		K6								Ø 0205
140	8-18-85 0758	S62	181						Q17									X						0805
140a	8-18-85 0756	R31	167				H7															X		0803
140b	8-17-85 0809	S62	181							X						H7								0815
141	8-18-85 0818	P04		R90			F6														X			0834
141a	8-18-85 0836		167											X					X					XXXXX
141b	8-18-85 0837			R90									X									X		0840
141c	XXXXXX		167								X										X			0841
141d	8-18-85 0842	P04	167										X					X						0846
141e	8-18-85 0850	P04	167							X							U18							0854
141f	8-18-85 0848	R31		R90										X		F6								0855
142	8-18-85 0855	S51	162						Q11									X						0900

FAHDR 2 3 272

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 273

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
142a	8-18-85 0857	R65	231				G8															X		0904
142b	8-18-85 0905	S51	162							X						G8								0912
143	8-18-85 0915	P47		R78			F10														X			0922
143a	8-18-85 0923		231											X					X					XXXXX
143b	8-18-85 0924			R78									X									X		0927
143c	XXXXXX		231								X										X			0929
143d	8-18-85 0930	P47	231										X					X						0933
143e	8-18-85 0940	P47	231							X							U19							0944
143f	8-18-85 0935	R65		R78										X		F10								0941
144	8-18-85 0945	S05							N17									X						0950
144a	8-18-85 0954	S05								X												X		0957
144b	8-18-85 0944	R38		R80			N11														X			0950

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
144c	8-18-85 0959			R80									X									X		1002
144d	8-18-85 1005	R38											X					X						1006
144e	8-18-85 1010	R38								X							U20							1014
144f	8-18-85 1008	S05		R80										X		N11								1015
145	8-18-85 1015	S32							N18									X						1019
145a	8-18-85 1024	S32								X												X		1028
145b	8-18-85 1017	R07		R65			N5														X			1023
145c	8-18-85 1029			R65									X									X		1032
145d	8-18-85 1033	R07											X					X						1036
145e	8-18-85 1041	R07								X							U21							1045
145f	8-18-85 1038	S32		R65										X		N5								1044
146	8-18-85 1046	S22							N19									X						1050

EFFECTIVE DATE JUL 08 1985

PAGE 274

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 275

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD.	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
146a	8-18-85 1056	S22								X												X		1059
146a	8-18-85 1047	R41		R106			L3														X			1054
146c	8-18-85 1100			R106									X									X		1103
146d	8-18-85 1104	R41											X					X						1107
146e	8-18-85 1112	R41								X							U22							1117
146f	8-18-85 1109	S22		R106										X		L3								1116
147	8-18-85 1118	S01							N20									X						1122
147a	8-18-85 1128	S01								X												X		1132
147b	8-18-85 1118	R46		R93			E3														X			1125
147c	8-18-85 1134			R93									X									X		1137
147d	8-18-85 1138	R46											X					X						1141
147e	8-18-85 1145	R46								X							U23							1149

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 276

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
147f	8-18-85 1144	S01		R93										X		E3								1150
148	8-18-85 1322	S19							N13									X						1327
148a	8-18-85 1330	S19								X												X		1334
148b	8-18-85 1322	R74		R83			C5														X			1327
148c	8-18-85 1335			R83									X									X		1338
148d	8-18-85 1339	R74											X					X						1342
148e	8-18-85 1346	R74								X							U24							1351
148f	8-18-85 1343	S19		R83										X		C5								1350
149	8-18-85 1352	S20							N14									X						1356
149a	8-18-85 1400	S20								X												X		1403
149b	8-18-85 1352	R37		R113			C11														X			1358
149c	8-18-85 1405			R113									X									X		1408

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
149d	8-18-85 1408	R37											X					X						DL 1411
149e	8-18-85 1415	R37								X							U25							DL 1420
149f	8-18-85 1413	S20		R113										X		C11								DL 1420
150	8-18-85 1421	S23							N15									X						DL 1425
150a	8-18-85 1430	S23								X												X		DL 1433
150b	8-18-85 1422	R35		R62			E13														X			DL 1428
150c	8-18-85 1434			R62									X									X		DL 1437
150d	8-18-85 1438	R35											X					X						DL 1441
150e	8-18-85 1445	R35								X							U26							DL 1449
150f	8-18-85 1442	S23		R62										X		E13								DL 1448
151	8-18-85 1451	S36							N16									X						DL 1454
151a	8-18-85 1458	S36								X												X		DL 1501

EFFECTIVE DATE JUL 08 1985

PAGE 27

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
151b	8-18-85 1451	R45		R79			L13														X			ZL 1456
151c	8-18-85 1502			R79									X									X		ZL 1505
151d	8-18-85 1506	R45											X					X						ZL 1509
151e	8-18-85 1514	R45								X							U27							ZL 1518
151f	8-18-85 1512	S36		R79										X		L13								ZL 1519
152	8-18-85 1519	S11							P18									X						ZL 1523
152a	8-18-85 1529	S11								X												X		ZL 1532
152b	8-18-85 1521	R17		R64			P10														X			ZL 1527
152c	8-18-85 1533			R64									X									X		ZL 1535
152d	8-18-85 1536	S11		R64										X		P10								ZL 1542
153	8-18-85 1545	P27	236				A5											X						ZL 1550
153a	8-18-85 1553		236							X											X			ZL 1554

EFFECTIVE DATE JUL 08 1985

PAGE 279

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 279

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
153b	8-18-85 1558	P27								X							T10							a.e. 1602
153c	8-18-85 1555	R17	236										X			A5								a.e. 1601
154	8-18-85 1603	S14							P19									X						a.e. 1606
154a	8-18-85 1610	S14								X												X		a.e. 1613
154b	8-18-85 1604	R47		R67			P6														X			a.e. 1608
154c	8-18-85 1614			R67									X									X		a.e. 1617
154d	8-18-85 1618	S14		R67										X		P6								a.e. 1623
155	8-18-85 1626	P03	246				A11											X						B 1634
155a	8/18/85 1637		246							X											X			B 1637
155b	8/18/85 1643	P03								X							T11							B 1647
155c	8/18/85 1639	R47	246										X			A11								B 1645
156	8/18/85	S09							P20									X						B 1651 ~~1648~~

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 280

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
156a	8/18/85 1657	S09								X												X		B 1702
156~~a~~b	8/18/85 1648	R06		R96			K2														X			B 1650
156c	8/18/85 1703			R96									X									X		B 1706
156d	8/18/85 1708	S09		R96										X		K2								B 1714
157	8/18/85 1717	P55	215				E15											X						B 1724
157a	8/18/85 1728		215							X											X			B 1730
157b	8/18/85 1734	P55								X							T12							B 1737
157c	8/18/85 1732	R06	215										X			E15								B 1735
158	8/18/85 1739	S21							P21									X						B 1742
158a	8/18/85 1753	S21								X												X		B 1759
158b	8/18/85 1743	R71		R98			F2														X			B 1752
158c	8/18/85 1801			R98									X									X		B 1804

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NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
158d	8/18/85 1806	S21		R98										X		F2								B 1813
159	8/18/85 1817	P10	223				L15											X						B 1824
159a	8/18/85 1827		223							X											X			B 1828
159b	8/18/85 1832	P10								X							T13							B 1839
159c	8/18/85 1830	R71	223										X			L15								B 1838
160	8/18/85 1836	S04							P22									X						B 1841
160a	8/18/85 1851	S04								X												X		B 1856
160b	8/18/85 1841	R32		R103			B6														X			B 1849
160c	8/18/85 1857			R103									X									X		B 1900
160d	8/18/85 1903	S04		R103										X		B6								B 1910
161	8/18/85 1921	P21	201				R11											X						B 1925
161a	8/18/85 1931		201							X											X			

EFFECTIVE DATE JUL 08 1985

PAGE 281

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

SANOR #24

SANOR #25

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 282

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
161b	8/18/85 2032	P21								X							T14							B 2034
161c	8/18/85 2026	R32	203 ~~204~~										X			R11								B 2034
162	8/18/85 2036	S35							P23									X						B 2039
162a	8/18/85 2049	S35								X												X		B 2050
162b	8/18/85 2039	R53		R81			B10														X			B 2047
162c	8/18/85 2055			R81									X									X		B 2058
162d	8/18/85 2100	S35		R81										X		B10								B 2108
163	8/18/85 2111	P61	224				R5											X						B 2118
163a	8/18/85 2119		224							X											X			B 2121
163b	8/18/85 2126	P61								X							T15							B 2129
163c	8/18/85 2123	R53	224										X			R5								B 2130
164	8-18-85 2303	S28							P24									X						563 2309

NSID

WESTINGHOUSE PROPRIETARY

Form #25

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE TYPO 283

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
164a	8-18-85 2317	S28								X												X		SGB 2320
164b	8-18-85 2308	R25		R86			F14														X			SGB 2315
164c	8-18-85 2322			R86									X									X		SGB 2325
164d	8-18-85 2326	S28		R86										X		F14								SGB 2333
165	8-18-85 2336	P19	206				L1											X						SGB 2342
165a	8-18-85 2353		206							X											X			SGB 2356
165b	8-19-85 0000	P19								X							T16							SGB 0003
165c	8-18-85 2358	R25	206										X			L1								SGB 0004
166	8-19-85 0004	S13							P25									X						SGB 0007
166a	8-19-85 0015	S13								X												X		SGB 0019
166b	8-19-85 0007	R43		R87			K14														X			SGB 0014
166c	8-19-85 0020			R87									X									X		SGB 0023

NSID
WESTINGHOUSE PROPRIETARY
FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
166d	8-19-85 0024	S13		R87										X		K14								SGS 0031
167	8-19-85 0035	P13	217				E1											X						SGS 0041
167a	8-19-85 0045		217							X											X			SGS 0048
167b	8-19-85 0053	P13								X							T17							SGS 0056
167c	8-19-85 0050	R43	217										X			E1								SGS 0058
168	8-19-85 0103	P30	180				L11											X						SGS 0110
168a	8-19-85 0116	P30	180							X							T18							SGS 0118
168b	8-19-85 0114	R22	16				J9											X						SGS 0121
168c	8-19-85 0125	R22	16							X							T19							SGS 0129
168d	8-19-85 0125	R55	179				J7											X						SGS 0131
168e	8-19-85 0136	R55	179							X							T20							SGS 0139
168f	8-19-85 0135	P33	185				L5											X						SGS 0142

EFFECTIVE DATE JUL 08 1985

PAGE 284

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 285

REVISED DATE

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
168g	8-19-85 0147	P33	185							X							T21							SGS 0149
168h	8-19-85 0146	P22	198				E5											X						SGS 0152
168i	8-19-85 0156	P22	198							X							T22							SGS 0159
168j	8-19-85 0156	R11	14				G7											X						SGS 0202
168k	8-19-85 0207	R11	14							X							T23							SGS 0211
168l	8-19-85 0210	R42	15				G9											X						SGS 0216
168m	8-19-85 0220	R42	15							X							T24							SGS 0226
168n	8-19-85 0220	P63	216				E11											X						SGS 0226
168o	8-19-85 0231	P63	216							X							T25							B 0235
168p	8/19/85 0754	S24	159						Q27									X						HP 0757
168q	8/19/85 0801	S24	159							X						L11								HP 0808
169	8/19/85 0800	S58	173						Q14									X						HP 0807

NSID 1014 REV. 2-1-83

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FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
169a	8/19/85 0811	S58	173							X						J9								JNP 0818
170	8/19/85 0809	S47	152						Q16									X						JNP 0817
170a	8/19/85 0821	S47	152							X						J7								JNP 0828
171	8/19/85 0819	S16	240						P11									X						JNP 0827
171a	8/19/85 0831	S16	240							X						L5								JNP 0838
172	8/19/85 0828	S31	8						P12									X						JNP 0837
172a	8/19/85 0841	S31	8							X						E5								JNP 0847
173	8/19/85 0842	S49	222						Q18									X						JNP 0846
173a	8/19/85 0850	S49	222							X						G7								JNP 0857
174	8/19/85 0848	S54	243						Q12									X						JNP 0855
174a	8/19/85 0900	S54	243							X						G9								JNP 0907
175	8/19/85 0858	S07	190						P13									X						JNP 0906

EFFECTIVE DATE JUL 08 1985

PAGE 286

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 287

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
175a	8/19/85 0910	S07	190							X						E11								HJP 0917
176	8/19/85 0920	R59	253				N8											X						HJP 0925
176a	8/19/85 0929	R59	253							X							T26							HJP 0934
176b	8/19/85 0928	P09	227				P3											X						HJP 0935
176c	8/19/85 0940	P09	227							X							T27							HJP 0944
176d	8/19/85 0938	P56	199				N2											X						HJP 0946
176e	8/19/85 0950	P56	199							X							S10							HJP 0953
176f	8/19/85 0949	P45	235				C2											X						HJP 0955
176g	8/19/85 0959	P45	235							X							S11							HJP 1002
176h	8/19/85 0958	P12	220				B3											X						HJP 1005
176i	8/19/85 1009	P12	220							X							S12							HJP 1012
176j	8/19/85 1008	R40	138				C8											X						HJP 1014

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

FUEL HANDLING DATA SHEET

EFFECTIVE DATE JUL 08 1985

PAGE 289

REVISED DATE

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
176k	8/19/85 1021	R40	138							X							S13							JWP 1025
176l	8/19/85 1018	P01	174				B13											X						JWP 1025
176m	8/19/85 1031	P01	174							X							S14							JWP 1035
176n	8/19/85 1030	P53	249				C14											X						JWP 1037
176o	8/19/85 1043	P53	249							X							S15							JWP 1047
176p	8/19/85 1040	P25	230				N14											X						JWP 1048
176q	8/19/85 1053	P25	230							X							S16							JWP 1057
176r	8/19/85 1052	P02	250				P13											X						JWP 1100
176s	8/19/85 1105	P02	250							X							S17							JWP 1108
176t	8/19/85 1103	S44	168				P4									P3								JWP 1107
176u	8/19/85 1110	S71	233				B12									P4								JWP 1131
177	8/19/85 1134	S44	168				P3									B12								JWP 1140

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 289

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
178	8/19/85 1144	S55	169				D14									C14								HNP 1149
178a	8/19/85 1314	S60	182				M2									D14								HNP 1320
179	8/19/85 1323	S55	169				C14									M2								HNP 1329
180	8/19/85 1332	S74	207				B4									B3								HNP 1338
180a	8/19/85 1341	S65	153				P12									B4								HNP 1346
181	8/19/85 1349	S74	207				B3									P12								HNP 1355
182	8/19/85 1358	S59	245				M14									N14								HNP 1403
182a	8/19/85 1406	S69	211				D2									M14								HNP 1412
183	8/19/85 1415	S59	245				N14									D2								HNP 1421
184	8/19/85 1415	R61	166						L11									X						HNP 1419
184a	8/19/85 1424	R61	166							X						P3								HNP 1502
185	8/19/85 1423	R72	218						M27									X						HNP 1431

FUEL HANDLING DATA SHEET

STEP NO.	DATE AND TIME	PULL: ASSY. NO.	PULL: TP OR PD	PULL: RCC	PULL: BPRA	PULL: SOURCE	FROM: REACTOR CORE POS.	FROM: NFS POS.	FROM: SFP POS.	FROM: UPENDER	FROM: TP TOOL	FROM: N.F.E.	FROM: RCC CHANGE FIXTURE 1	FROM: RCC CHANGE FIXTURE 2	FROM: RCC CHANGE FIXTURE 3	INSERT IN: REACTOR CORE POS.	INSERT IN: SFP POS.	INSERT IN: UPENDER	INSERT IN: TP TOOL	INSERT IN: N.F.E.	INSERT IN: RCC CHANGE FIXTURE 1	INSERT IN: RCC CHANGE FIXTURE 2	INSERT IN: RCC CHANGE FIXTURE 3	INIT. AND TIME
185a	8/19/85 1505	R72	218							X						N2								JWP 1515
186	8/19/85 1502	R27	6						M16									X						JWP 1512
186a	8/19/85 1518	R27	6							X						C2								JWP 1526
187	8/19/85 1514	R26	155						L14									X						JWP 1524
187a	8/19/85 1530	R26	155							X						B3								JWP 1536
188	8/19/85 1526	R13	135						M20									X						JWP 1535
188a	8/19/85 1540	R13	135							X						B13								JWP 1546
189	8/19/85 1538	R54	145						M19									X						JWP 1546
189a	8/19/85 1549	R54	145							X						C14								JWP 1556
190	8/19/85 1548	R64	149						M24									X						JWP 1555
190a	8/19/85 1559	R64	149							X						N14								JWP 1605
191	8/19/85 1557	R01	137						M23									X						JWP 1604

EFFECTIVE DATE JUL 08 1985

PAGE 290

REVISED DATE

NSID 1014 REV. 2-1-83

NSID

WESTINGHOUSE PROPRIETARY

FP-INT-R4 Rev.0

NSID 1014 REV. 2-1-83

EFFECTIVE DATE JUL 08 1985

PAGE 291

REVISED DATE

FUEL HANDLING DATA SHEET

NSID

WESTINGHOUSE PROPRIETARY

STEP NO.	DATE AND TIME	PULL					FROM									INSERT IN								INIT. AND TIME
		ASSY. NO.	TP OR PD	RCC	BPRA	SOURCE	REACTOR CORE POS.	NFS POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	REACTOR CORE POS.	SFP POS.	UPENDER	TP TOOL	N.F.E.	RCC CHANGE FIXTURE 1	2	3	
191a	8/19/85 1608	R01	137							X						P13								INP 1615
192	8/19/85 1606	S53	7						P14									X						INP 1615
192a	8/19/85 1619	S53	7							X						N8								INP 1625
193	8/19/85 1616	S72	251						P16									X						INP 1626
193a	8/19/85 1630	S72	251							X						C8								INP 1630
							END OF PHASE III																	

FP-INT-R4 Rev.0

* FAHOR 15
~~PO 133 NOT CORRECTLY~~
INSERTED IN FUEL ELEMENT

** FAHOR 16
ROBLET WAS BENT
& STRAIGHTENED

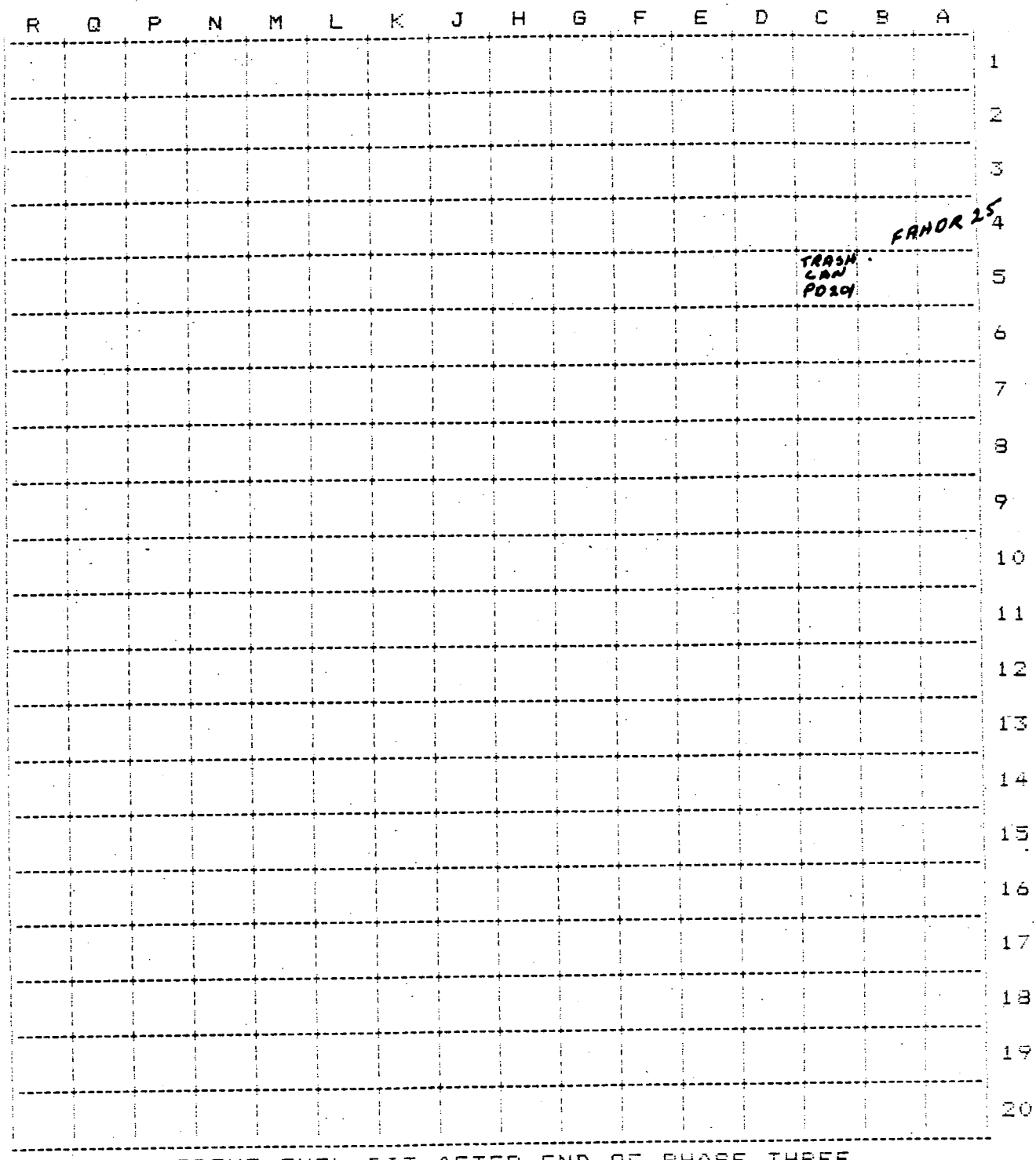
8/10/85 - 85 - 115 - OPS
TPC a.s.

FAHOR 25

JJ	HH	GG	FF	EE	DD	CC	BB	AA	Z	Y	X	W	V	U	T	S	
																	1
																	2
																	3
																	4
																	5
																	6
																	7
																	8
				FAHOR 25													9
	175 B55	133 * B09	139 B42	~~203~~ B37	20 B38	165 B35	18 B59	252 P57	241 P48	226 C23	237 C08	219 C32	209 R69	P40	P27	199 P56	10
143 B64	12P11X C10	16P47 C29	16P42 B63	12P43X B25	12P53X B34	12P41X B62	12P28X B45	12P29X P44	12P54X C16	12P33X P14	16P44 C64	12P50X C60	12P45X R44	P23	P03	235 P45	11
156 B50	12P7X C39	16P41 B51	20P11 C07	A9P4 B46	42P89X B27	12P36X B10	12P21X B16	SPS11 C59	12P42X C57	16P64 C22	A9P3 C42	42P62X C50	42P57X R29	R19	P55	220 P12	12
177 B24	12P6X B02	16P50 B48	17 B32	A9P1 B52	12P25X B44	12P9X B23	12P19X B22	42P75X C46	204 C12	12P30X P24	16P56 C02	42P78X C54	42P63X R12	P20	P19	138 R40	13
144 C13	12P18X B13	42P94X B19	12P32X B43	16P46 B07	12P44X C27 *	12P3X B29	225 B41	42P88X C05	248 P32	A9P6 C24	12P17X C53	42P71X R76	42P64X R18	P64	P21	174 P01	14
247 B04	20P23 C55	16P63 B47	20P29 B57	~~16P52~~ 20P16 B17	12P24X B40	12P37X B11	157 B14	42P47X C63	42P93X P07	12P34X P34	20P21 C20	42P73X R14	12P49X R50	R49	P61	249 P53	15
148 ** B49	20P1 B54	16P61 B31	20P3 B18	~~20P18~~ 16P52 B20	146 B56	154 B30	191 C61	42P92X C19	228 P41	20P10 C26	239 C11	42P70X R20	196 P11	193 P39	P19	230 P25	16
150 B03	42P59X B06	20P17 B01	16P59 C29	12P54X 46 B08	213 B05	136 B60	164 B33	160 C47	12 P33	42P58X P16	42P91X C17	42P85X R75	212 R34	172 P43	P13	250 P02	17
19 B39	12P23X B36	16P49 B26	20P6 B21	16P60 B53	~~12P44X~~ C31 *	147 B12	12P35X B15	SPS12 C15	194 P37	12P12X C37	42P86X A24	42P66X P36	P54	167 P04	180 P30		18
12P1X A52	12P10X A34	16P53 A39	178 B58	176 B61	171 C03	188 C01	163 B28	158 C36	205 P53	20P12 C43	42P68X C35	42P72X P08	P60	231 P47	1a R22		19
20P24 A06	16P55 A30	16P48 A21	B8P2 A32	A8P2 A20	B8P3 A13	A8P4 A53	16P51 A56	42P69X P49	C8P7 C34	C8P4 C38	20P14 C41	42P82X P51	P52	R38	179 R33		20

SPENT FUEL PIT AFTER END OF PHASE THREE
SHEET 1 OF 4

* BPRA 12P44X parts located in F.A.'s C27 & ~~C31~~ a.s.



SPENT FUEL PIT AFTER END OF PHASE THREE
SHEET 2 OF 4

JJ	HH	GG	FF	EE	DD	CC	BB	AA	Z	Y	X	W	V	U	T	S	
~~R523~~ S23 A51	B9P6 A37	12P15X A60	20P22 A55	~~AP52~~ S21 A54	~~R524~~ S24 A45	~~R527~~ S27 A64	~~R526~~ S26 A59	229 P38	C8P5 P17	42P80X P19	12P31X C40	42P84X P29	P46	R07	185 P33		21
12P2X A27	12P13X A61	~~R525~~ S25 A63	12P14X A31	20P9 A02	~~R528~~ S28 A43	~~R522~~ S22 A38	12P5X A35	208 P28	C8P1 C04	42P83X C38	42P55X C45	42P67X R67	P05	R41	199 P22		22
A8P3 A03	20P20 A16	20P30 A46	20P4 A33	20P9 A48	20P18 A49	20P19 A50	12P8X A26	234 P06	C8P3 C14	42P65X C44	242 C21	12P48X R39	P59	R46	14 A11		23
B8P1 A28	20P28 A08	16P62 A17	20P26 A36	B8P4 A04	BP~~52~~ S2 A07	20P5 A15	20P15 A65	202 P62	C8P8 C09	42P81X C52	42P60X C18	42P74X R15	R60	R74	15 R42		24
	20P25 A47	16P54 A01	16P45 A29	A8P1 A14	20P2 A41	16P43 A23	20P27 A62	C8P2 P26	12P26X C33	200 C30	42P77X C06	42P76X R73	P50	R37	216 P63		25
	B9P2 A57	20P7 A12	B9P3 A18	A9P2 A05	12P16X A09	16P57 A11	B9P4 A25	C8P6 P42	42P56X C56	12P27X C62	42P87X C25	12P51X R28	P15	R33	253 R59		26
158	~~R521~~ S21 A44	20P13 A58	B9P1 A42	B9P5 A22	16P58 A40	A9P5 A10	12P4X A19	12P52X P31	12P38X C49	42P61X C48	42P90X C51	42P79X R63	R30	R45	227 P09		27
																	28
																	29
																	30
																	31
																	32
																	33
																	34
																	35

8/10/85 G.S. - OPS
TPC 85-115

SPENT FUEL PIT AFTER END OF PHASE THREE
SHEET 3 OF 4

	R	Q	P	N	M	L	K	J	H	G	F	E	D	C	B	A
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
32															DFA	
33															~~[illegible]~~	
34																
35																

SPENT FUEL PIT AFTER END OF PHASE THREE
SHEET 4 OF 4

8/10/85 OPS
TPC 85-115
A.S.

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	
				215 R06	59Z T18	55Z T62	184 S64	15Z T49	53Z T06	225 R71	--	--	--	--	15
		145 R54	182 S60	4P5Z T72	R86 S23	16P15Z T76	R72 S30	16P10Z T46	R87 S13	4P7Z T30	211 S67	149 R64	--	--	14
	135 R13	R69 S63	12P25Z T52	R62 S25	16P24Z T67	R105 S17	SPS13 S76	R111 S18	16P23Z T37	R79 S36	12P9Z T56	R104 S48	137 R01	--	13
	168 S44	12P22Z T55	R95 S45	SS15 S75	195 R33	12P1Z T28	R100 S26	12P14Z T13	244 R48	186 S38	R74 S46	12P10Z T73	207 S74	--	12
246 R47	4P2Z T40	R113 S20	09 S52	190 S07	12P18Z T27	254 R57	12P27Z T08	R89 R36	12P6Z T19	159 S24	232 S56	R80 S05	4P4Z T54	~~201~~ 203 R32	11
2Z T04	R91 S35	16P18Z T69	238 R68	12P5Z T26	R78 R65	16P2Z T22	R71 R52	16P3Z T01	R61 R58	12P3Z T25	189 R02	16P12Z T44	R64 S11	1Z T03	10
08Z T42	16P1Z T74	R112 S29	12P26Z T31	R76 R23	16P5Z T07	243 S54	183 S68	173 S58	16P11Z T20	134 R16	12P4Z T14	R77 S02	16P20Z T64	07Z T39	9
13 S50	R99 S03	251 S72	183 S12	12P17Z T15	~~R27~~ 73 R10	162 S51	R94 R03	170 S42	R70 R66	12P21Z T02	R91 S06	07 S33	R82 S34	137 S43	8
57Z T49	16P14Z T41	R102 S15	12P7Z T35	11 R09	16P16Z T32	222 S49	181 S62	152 S47	16P8Z T16	R66 R08	12P12Z T24	R75 S25	16P21Z T65	35Z T51	7
58Z T34	R103 S04	16~~P22~~ 82Z T71	221 R62	12P13Z T29	R90 R31	16P17Z T36	R109 R70	16P9Z T23	R84 R56	12P23Z T33	10 R51	16P13Z T59	R67 S14	62Z T11	6
22Z R17	4P6Z T47	R83 S19	132 S66	08 S31	12P8Z T05	R68 R04	12P20Z T30	151 R21	12P24Z T17	240 S16	197 S57	R65 S32	4P8Z T38	224 R83	5
	153 S65	12P16Z T75	R107 S61	192 S40	161 R05	12P2Z T21	R92 S53	12P28Z T09	140 R24	SS14 S73	R85 S37	12P15Z T60	233 S71		4
	155 R26	R97 S39	12P19Z T66	R93 S01	16P19Z T45	R63 S10	SS11 S70	R110 S27	16P6Z T63	R106 S22	12P11Z T57	R101 S67	166 R61		3
		06 R27	245 S59	4P3Z T43	R98 S21	16P7Z T61	R108 S08	16P4Z T70	R96 S09	4P1Z T53	169 S55	218 R72			2
				217 R43	62Z T12	05Z T58	141 S41	09Z T68	51Z T10	206 R25					1

FAMOR 25

8/10/85

TPC 85-115 OPS Q.S.

TPC 85-111 OPS 8/6/85 Q.S.

0
270 --+-- 90
180

0 0
0 0

NORTH

INT CORE 5 FINAL CONDITIONS

APPENDIX C

GENERATION OF WITHDRAWAL LIMITS TO ENSURE A NEGATIVE MODERATOR COEFFICIENT

As can be seen from Table 1.2 on page 1-4, the measured isothermal temperature coefficient for ARO Is -1.401 pcm/°F. It is assumed that -2.03 pcm/°F is the doppler temperature coefficient. Therefore, the moderator temperature coefficient for ARO is (-1.401)-(-2.03) = +0.629.

According to the predictions of the Plant Operations Package for Indian Point Unit 3 Nuclear Power Plant, Cycle 5 (POP, WCAP-10873), Bank D must be inserted to a level of 110 steps to ensure a negative moderator temperature coefficient under the above conditions. This information is taken from Table 2.6-c, one of five tables showing the effect on MTC as a function of partial rod insertion.

In order to draw a curve, withdrawal limits must be calculated for other boron concentrations. Let us postulate pulling the rods from the above position to 140 steps. Using Table 2.6-c as we did before, we find that an increase of .216 pcm/°F is obtained. In order to offset this increase, it is necessary to lower the boron concentration by an amount determined from the equation provided on page 2-14 of the POP.

$$C_B \text{ (Rod Config.) X } \frac{C_B\text{-ref (ppm)} - C_B \text{ measured (ppm)}}{100}$$

$$= 1.04 \text{ X } \frac{1496 - C_B}{100} = 0.216$$

Therefore, C_B = 1475 ppm

This provides us with a second set of withdrawal limit conditions:

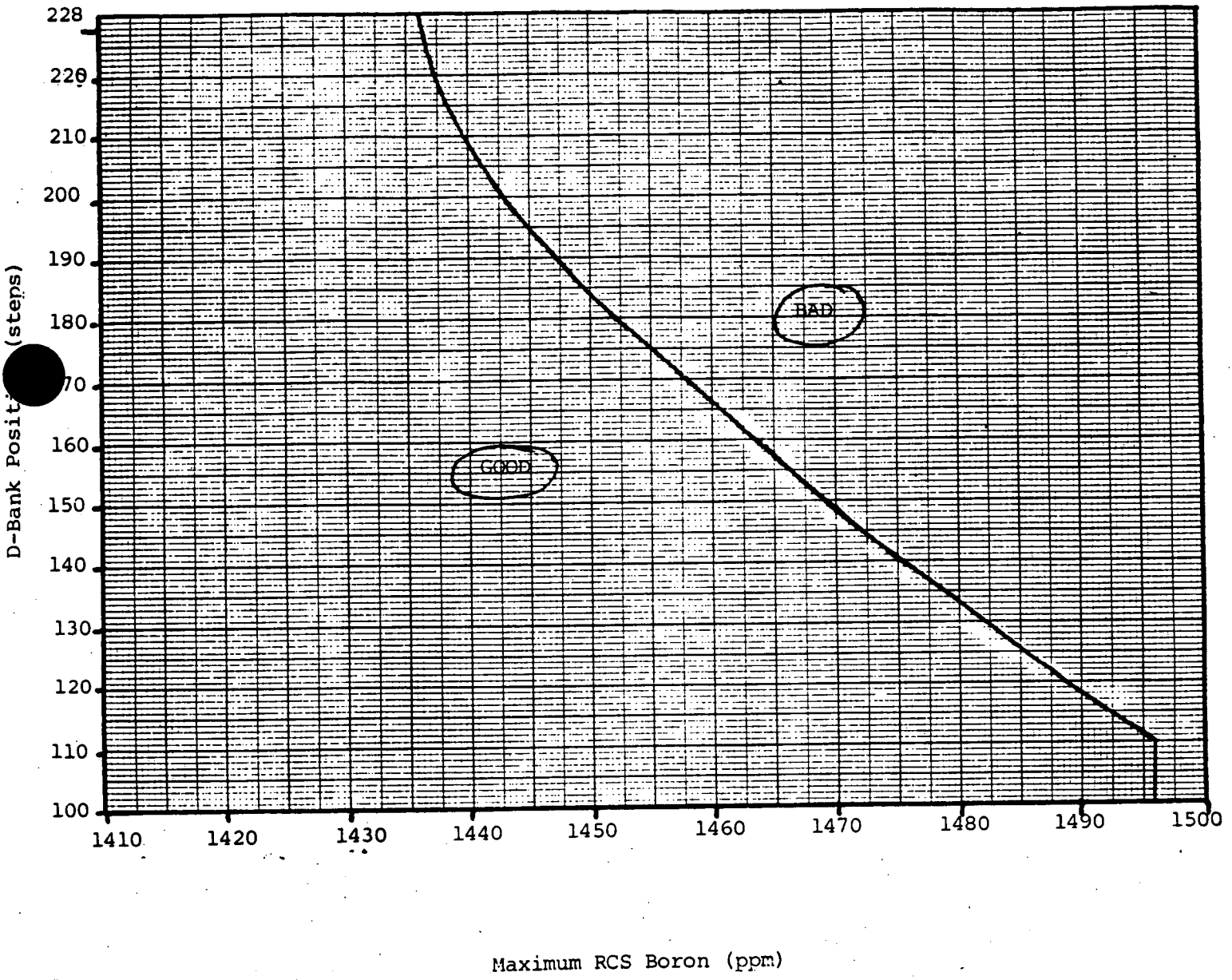
D at 140 and C_B at 1475 ppm

Using the same basic technique, insertion limits can be calculated for any rod configuration or boron concentration chosen. Four other points were selected, and the calculational results are tabulated below:

TABLE C-1
SUMMARY OF WITHDRAWAL LIMIT CALCULATIONS

Bank D Position (steps)	Increase in MTC (pcm/°F) from original configuration of D/110	Corresponding decrease in Boron (ppm)	C_B (ppm)
110	0.0	0	1496
140	.216	21	1475
160	.336	32	1464
180	.456	44	1452
200	.556	53	1443
228	.626	60	1436

Figure C-1 presents the withdrawal limit curve.

FIGURE C-1

Boron Concentration vs.
Rod Position to Ensure
a Negative Moderator
Temperature Coefficient