

Crystal River Unit 3
Docket No. 50-302

3F0993-03

Attachment 1

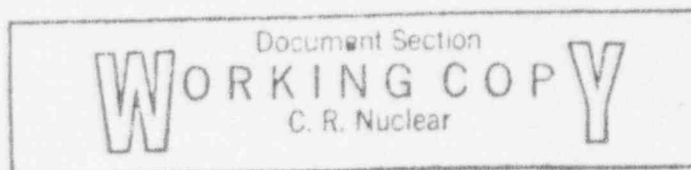
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11-15-91



PERFORMANCE TESTING PROCEDURE

PT-340

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

EGDG-1A AND 1B BLOCK LOADING
VOLTAGE DROP VALIDATION

THIS PROCEDURE ADDRESSES SAFETY RELATED COMPONENTS

APPROVED BY: Interpretation Contact

[Signature]

DATE: 10/29/91

9309200030 930910
PDR ADDCK 05000302
S PDR

INTERPRETATION CONTACT: Manager, Nuclear Plant
Systems Engineering

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1.0 PURPOSE

The purpose of this procedure is threefold:

- 1) Measure at the worst case conditions described in the EDG "A" and "B" Loading Evaluation, the lowest 4160, 480, 120V bus voltages
- 2) Provide data taken at those conditions to validate the EDG "A" and "B" Loading Evaluation Calculation
- 3) Validate the EDG "A" and "B" Voltage Dip and Frequency Recovery Review

The results of this test will be used as a basis to respond to the NRC request for measurements of the 480/120 Voltage as required by Reference 2.2.

This Performance test will be conducted in conjunction with the performance of SP-417.

2.0 REFERENCES

2.1 IMPLEMENTING PROCEDURES

SP-417, Refueling Interval Integrated Plant Response To An Engineered Safeguards Actuation

CP-113A, Work Request Initiation and Work Package Control

2.2 DEVELOPMENTAL REFERENCES

NRC Letter to FPC memo 3N0989-20, Dated September 18, 1989
NOE Letter to M. J. Fitzgerald memo NEA90-0398, Dated March 7, 1990

3.0 PERSONNEL INDOCTRINATION

3.1 DESCRIPTION

Crystal River Unit 3 has either tested to determine or has calculated the voltages at the 4160 volt bus during simulated worst case conditions associated with Emergency Diesel Generator (EDG) "A"/"B." Worst case conditions have been determined to be Loss Of Offsite Power (LOOP) with an ES actuation, particularly after the completion of BLOCK 1 and the BLOCK 2 loads are starting. Data from this test would be used to determine the voltages at the 480/120 volt AC loads being sequenced on by the EDG. This would validate the calculated starter voltages and further insure that problems do not exist with Safety Related equipment starting and later dropping out. MAR 88-05-24-01 modified the BLOCK sequencing of the EDG loads to improve the voltage dips. Test data from the Voltage Dip Test will be used to update the EDG Loading Evaluation Calculations to incorporate changes due to this MAR.

3.2 LIMITS AND PRECAUTIONS

- 3.2.1 For work located in the Radiation Controlled Areas, due consideration must be given to the ALARA program. This may result in a determination that special preparation and/or precautions may be necessary.

3.3 ACCEPTANCE CRITERIA

At no time during the loading sequence should the frequency and voltage at the diesel-generator output decrease to less than 95 percent of nominal and 75 percent of nominal, respectively. Frequency should be restored to within 2 percent of nominal, and voltage should be restored to within 10 percent of nominal within 60 percent of each load sequence time interval (Reg. Guide 1.9).

At no time during the loading sequence should the voltage at the MCC contactors decrease to less than 65 percent of nominal (FSAR Section 8.2.3, page 8-24).

3.4 PREREQUISITES

3.4.1 Equipment

- o 14 Powerscope's
- o Powerscope Paper
- o Cable to connect Powerscopes
- o 2 Visicorders calibrated with tenth of a second time lines.
- o 6 low gain modules
- o Visicorder Paper
- o Additional test equipment as required at the direction of the Test Engineer
- o Extension cords
- o Boundary tape

3.4.2 Supplies

None

3.4.3 Personnel Requirements

- 3.4.3.1 Two System Protection and Control Technicians to connect test equipment per Enclosure 1 and 2.
- 3.4.3.2 Two Electricians to connect test equipment per Enclosure 1 and 2.
- 3.4.3.3 One person per recorder (on a per train basis) should be assigned to monitor their operation and insure that the correct data is being recorded.
- 3.4.3.4 This procedure is written to be performed by two Nuclear Electricians and two System Protection and Control Technicians reporting to their respective Supervisors. There are no other skills required.

3.4.4 Data Collection

See Enclosure 3 and 4

3.4.5 Initial Conditions

- 3.4.5.1 Notify the Nuclear Shift Supervisor on duty that this test is ready to be performed.
- 3.4.5.2 Limits and Precautions and Personnel Indoctrination have been read and understood.
- 3.4.5.3 Plant heatup is in progress per OP-202, Plant Heatup.
- 3.4.5.4 Necessary communication systems should be checked to be operational prior to commencing this test.
- 3.4.5.5 Test equipment should be connected to Non - E.S. backed supplies during this test to ensure that all data is recorded during the LOOP and BLOCK loading.

NOTE: The following MOV's may be disabled during the test by removing the leads connecting the valve to the contactor at the MCC and tagging them.

- 3.4.5.6 Verify that SP-417 has been revised to include the following:
 - o Control Power to MUV-73 from MCC 3A3, Unit 1DF breaker is not positioned "OFF" but is instead left "ON"
 - o Control Power to MUV-257 from MCC 3B2, Unit 6B breaker is not positioned to the "Lock-Reset" position but is instead left "ON"
 - o Control Power to MUV-27 from MCC 3AB, Unit 3C breaker is not positioned to the "Lock-Reset" position but is instead left "ON"
- 3.4.5.7 Test measurement equipment has been connected to measure voltages across the Priority 1 and 2 loads listed in Enclosure 1 and 2.
- 3.4.5.8 This Performance test is to be run in conjunction with SP-417, Refueling Interval Integrated Plant Response To An Engineered Safeguards Actuation.
- 3.4.5.9 The equipment being monitored by this test should be available (i.e., not out on clearances) to insure data will be obtained. The equipment is listed below.
 - o MUV-40
 - o MUV-260
 - o MUV-73
 - o DHV-34
 - o AHF-226
 - o MUV-27
 - o MUP-4C
 - o MUV-257

4.0 INSTRUCTIONS

CAUTION: Coordinate Steps 4.1 through 4.4 prior to simulating an undervoltage condition on ES "A" or ES "B" 4160 Volt Bus per SP-417.

NOTE: It takes approximately 21 seconds after the "SLUR TEST" pushbutton was depressed before the EDG-1A or -1B output breaker 3209 or 3210 will close.

- 4.1 Program the Powerscopes for the necessary parameters as directed by Engineering prior to the simulation of an undervoltage condition on ES "A" or ES "B" 4160 Volt Bus.
- 4.2 Ensure the Powerscopes identified in Enclosure 1 or 2 for the EDG being tested are in the monitor mode prior to the EDG breaker closing onto the 4160 Volt Bus.
- 4.3 MUP-4C (Gear Oil Pump for MUP-1C) will start when MUP-1C is started and run for 3 minutes.
IF MUP-4C stops before the EGDG block load is complete,
THEN have Operations restart MUP-4C.
- 4.4 Start the Visicorder identified in Enclosure 1 or 2 for the EDG being tested just prior to the EDG breaker closing onto the 4160 Volt Bus.
- 4.5 Verify that the Powerscopes and Visicorder are operating properly and data is being recorded.
- 4.6 Stop the Powerscopes and Visicorder for the EDG being tested once the BLOCK loading has been completed and the EDG is supplying the 4160 Volt ES Bus.
- 4.7 Label the Powerscope and Visicorder chart paper with the following; PT-340, Date, Measuring Equipment Number, Phases Recorded and EDG.
- 4.8 Repeat Steps 4.1 through 4.7 and verify that Section 3.0 is still satisfied prior to starting the test on the other EDG.
- 4.9 Notify the Nuclear Shift Supervisor and/or Operator on duty that the test is complete.
- 4.10 After the completion of SP-417, remove the test equipment installed by Enclosure 1 and 2 per Section 5.0.

5.0 FOLLOW-UP ACTIONS

5.1 RESTORATION INSTRUCTIONS

- 5.1.1 Remove PowerScope connections from the 4160 Volt Engineered Safeguards Bus 3A PT's secondary for each phase.

Completed By: William C. Smith Date: 11/20/91

Independent Verification: W. F. Kelly Date: 11/20/91

- 5.1.2 Remove PowerScope connections from the EGDG-1A 4160 Volt Generator output PT's secondary for each phase.

Completed By: William C. Smith Date: 11/20/91

Independent Verification: W. F. Kelly Date: 11/20/91

- 5.1.3 Remove PowerScope connections from the 480 Volt Engineered Safeguards Bus 3A PT's secondary for each phase.

Completed By: William C. Smith Date: 11/20/91

Independent Verification: W. F. Kelly Date: 11/20/91

- 5.1.4 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3A2, Unit 1A for each phase.

Completed By: Michael Rall Date: 11-20-91

Independent Verification: Clifford M. Hanson Date: 11-20-91

- 5.1.5 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3A2, Unit 7A.

Completed By: Michael Rall Date: 11-20-91

Independent Verification: Clifford M. Hanson Date: 11-20-91

- 5.1.6 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3A2, Unit 8C.
Completed By: Michael Rall Date: 11-20-91
Independent Verification: Clifford M. Hanson Date: 11-20-91
- 5.1.7 Remove PowerScope connections from the 480 Volt Engineered Safeguards Bus 3A1, Unit 13A for each phase.
Completed By: Michael Rall Date: 11-20-91
Independent Verification: Clifford M. Hanson Date: 11-20-91
- 5.1.8 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3A1, Unit 4C.
Completed By: Michael Rall Date: 11-20-91
Independent Verification: Clifford M. Hanson Date: 11-20-91
- 5.1.9 Remove PowerScope connections from the 480 Volt Engineered Safeguards Bus 3A3, Unit 1AC for each phase.
Completed By: Michael Rall Date: 11-20-91
Independent Verification: Clifford M. Hanson Date: 11-20-91
- 5.1.10 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3A3, Unit 1DF.
Completed By: Michael Rall Date: 11-20-91
Independent Verification: Clifford M. Hanson Date: 11-20-91
- 5.1.11 Remove Visicorder connections from the 4160 Volt Engineered Safeguards Bus 3A PT's secondary for each phase.
Completed By: William Crist Date: 11/21/91
Independent Verification: W. B. Jeff Date: 11/20/91
- 5.1.12 Remove PowerScope connections from the 4160 Volt Engineered Safeguards Bus 3B PT's secondary for each phase.
Completed By: Steve Cox Date: 11-18-91
Independent Verification: William Crist Date: 11-18-91

- 5.1.13 Remove PowerScope connections from the EGDG-1B 4160 Volt Generator output PT's secondary for each phase.
Completed By: Steve Cox Date: 11-18-91
Independent Verification: William Craft Date: 11-18-91
- 5.1.14 Remove PowerScope connections from the 480 Volt Engineered Safeguards Bus 3B PT's secondary for each phase.
Completed By: Steve Cox Date: 11-18-91
Independent Verification: William Craft Date: 11-18-91
- 5.1.15 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3B3, Unit 7AC for each phase.
Completed By: Charles N. Martin Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.16 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3B3, Unit 2KN.
Completed By: Charles N. Martin Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.17 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3AB, Unit 1A for each phase.
Completed By: Charles N. Martin Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.18 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3AB, Unit 3C.
Completed By: Charles N. Martin Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.19 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3B1, Unit 1A for each phase.
Completed By: Charles N. Martin Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91

- 5.1.20 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3B1, Unit 3D.
Completed By: Charles N. Hester Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.21 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3B2, Unit 6A for each phase.
Completed By: Charles N. Hester Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.22 Remove PowerScope connections from the 480 Volt Engineered Safeguards MCC 3B2, Unit 6B.
Completed By: Charles N. Hester Date: 11-18-91
Independent Verification: Dave McPherson Date: 11/18/91
- 5.1.23 Remove Visicorder connections from the 4160 Volt Engineered Safeguards Bus 3B PT's secondary for each phase.
Completed By: Steve Cox Date: 11-18-91
Independent Verification: William C. Smith Date: 11-18-91

ENGINEERED SAFEGUARDS "A" SIDE
TEST EQUIPMENT SETUP

1.0 Record the following:

PowerScope #1 4160V E.S. A
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage

PowerScope #2 480V E.S. A
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage

PowerScope #3 480V E.S. MCC 3A2
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #3A 480V E.S. MCC 3A2
Channel 1 for 120V Relay Coil

PowerScope #4 480V E.S. MCC 3A3
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #5 480V E.S. MCC 3A1
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #6 EGDG-1A OUTPUT
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage

Visicorder #1 4160V E.S. A
Low Gain Device for Phase A Voltage
Low Gain Device for Phase B Voltage
Low Gain Device For Phase C Voltage

I.D NO.	CAL.DUE DATE
ST-674	3/17/92
ST-674	3/17/92
ST-674	3/17/92
ST-682	3/17/92
ST-682	3/17/92
ST-682	3/17/92
ST-683	3/17/92
ST-683	3/17/92
ST-683	3/17/92
ST-683	3/17/92
ST-663	3/17/92
ST-681	3/17/92
ST-681	3/17/92
ST-681	3/17/92
ST-681	3/17/92
ST-684	3/17/92
ST-684	3/17/92
ST-684	3/17/92
ST-684	3/17/92
ST-685	3/17/92
ST-685	3/17/92
ST-685	3/17/92
ST-670	11/14/91*
ST-665	11/14/91*
ST-667	11/14/91*

* DATE SPECIAL CAL PERFORMED, WILL BE
POST CALIBRATED AFTER TEST

Rkw 11/18/91

2.0 Record the device and ID number of test equipment used for the calibration of the Visicorder traces

DEVICE	ID NUMBER	CAL DUE DATE
<u>ABLE</u>	<u>T I 1924</u>	<u>3-11-92</u>
<u>VOLTMETER</u>	<u>T I 1042</u>	<u>2-19-92</u>
_____	_____	_____

3.0 Record PowerScope calibrated parameters:

PowerScope #1 4160V E.S. A

Phase A voltage	<u>20</u>	volts/div
Phase B voltage	<u>20</u>	volts/div
Phase C voltage	<u>20</u>	volts/div

PowerScope #2 480V E.S. A

Phase A voltage	<u>20</u>	volts/div
Phase B voltage	<u>20</u>	volts/div
Phase C voltage	<u>20</u>	volts/div

PowerScope #3 480V MCC 3A2

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #3A 480V MCC 3A2

120V Relay Coil	<u>25</u>	volts/div
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PowerScope #4 480V MCC 3A3

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #5 480V MCC 3A1

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #6 EGDG-1A OUTPUT

Phase A voltage	<u>20</u>	volts/div
Phase B voltage	<u>20</u>	volts/div
Phase C voltage	<u>20</u>	volts/div

Visicorder #1 4160V E.S. A

Phase A voltage

1.378 volts/mm

Phase B voltage

1.378 volts/mm

Phase C voltage

1.378 volts/mm

4.0 Connect PowerScopes as follows:

Connect PowerScope #1 to the 4160 Volt Engineered Safeguards Bus 3A PT's Secondary to record a phase to neutral voltage for each phase.

Installed by: Steve Cox Date: 11-18-91

Independent Verification: Walter Cox Date: 11-18-91

Connect PowerScope #2 to the 480 Volt Engineered Safeguards Bus 3A PT's Secondary to record a phase to neutral voltage for each phase.

Installed by: Steve Cox Date: 11-18-91

Independent Verification: Walter Cox Date: 11-18-91

Connect three channels of PowerScope #3 to the 480 Volt ES MCC 3A2, Unit 1A incoming to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the Unit 7A CPT secondary or the coil of Relay 42/5MF.

Installed by: Brian Anderson Date: 11-15-91

Independent Verification: W. K. Kinn Date: 11-15-91

As directed by the System Engineer, connect PowerScope #3A to the 480 Volt ES MCC 3A2, Unit 8C CPT's secondary or the coil of Relay 42/10MF.

Installed by: Brian Anderson Date: 11-15-91

Independent Verification: W. K. Kinn Date: 11-15-91

ENCLOSURE 1
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Connect three channels of PowerScope #4 to the 480 Volt ES MCC 3A3, Unit 1AC incoming to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the Unit 1DF CPT secondary or the coil of Relay 42/R.

Installed by: *Eric Williams* Date: 11-16-91

Independent Verification: *J. K. [Signature]* Date: 11-16-91

Connect three channels of PowerScope #5 to the 480 Volt ES MCC 3A1, Unit 13A incoming to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the 4C CPT secondary or the coil of Relay 42/BMR.

Installed by: *Charles W. [Signature]* Date: 11-18-91

Independent Verification: *D. [Signature]* Date: 11/18/91

Connect three channels of PowerScope #6 to the EGDG-1A 4160 Volt Generator Output PT's Secondary to record a phase to neutral voltage for each phase.

Installed by: *Steve Cox* Date: 11-18-91

Independent Verification: *William [Signature]* Date: 11-18-91

Connect three channels of Visicorder #1 to the 4160 Volt Engineered Safeguards Bus 3A PT's Secondary to record a phase to neutral voltage for each phase.

Installed by: *Steve Cox* Date: 11-18-91

Independent Verification: *William [Signature]* Date: 11-18-91

ENGINEERED SAFEGUARDS "B" SIDE
TEST EQUIPMENT SETUP

1.0 Record the following:

PowerScope #7 4160V E.S. B
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage

PowerScope #8 480V E.S. B
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage

PowerScope #9 480V E.S. MCC 3B3
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #10 480V E.S. MCC 3AB
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #11 480V E.S. MCC 3B1
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #12 480V E.S. MCC 3B2
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage
Channel 4 for 120V Relay Coil

PowerScope #13 EGDG-1B OUTPUT
Channel 1 for Phase A Voltage
Channel 2 for Phase B Voltage
Channel 3 for Phase C Voltage

Visicorder #1 4160V E.S. A
Low Gain Device for Phase A Voltage
Low Gain Device for Phase B Voltage
Low Gain Device For Phase C Voltage

I.D. NO.	CAL.DUE DATE
ST-675	3/17/92
ST-675	3/17/92
ST-675	3/17/92
ST-680	3/17/92
ST-680	3/17/92
ST-680	3/17/92
ST-679	3/17/92
ST-679	3/17/92
ST-679	3/17/92
ST-679	3/17/92
ST-672	3/17/92
ST-672	3/17/92
ST-672	3/17/92
ST-672	3/17/92
ST-664	3/17/92
ST-664	3/17/92
ST-664	3/17/92
ST-664	3/17/92
ST-678	3/17/92
ST-678	3/17/92
ST-678	3/17/92
ST-678	3/17/92
ST-673	3/17/92
ST-673	3/17/92
ST-673	3/17/92
ST-668	11/14/91 *
ST-668	11/14/91 *
ST-209	11/14/91 *

SI-708

* BASE SPECIAL CAL PERFORMED,
WILL BE POST CALIBRATED AFTER TEST
RAW
11/14/91

- 2.0 Record the device and ID number of test equipment used for the calibration of the Visicorder traces

DEVICE	ID NUMBER	CAL DUE DATE
<u>DOUBLE</u>	<u>TI 1924</u>	<u>3/11/92</u>
<u>VOLTMETER</u>	<u>TI 1042</u>	<u>2/19/92</u>

- 3.0 Record PowerScope calibrated parameters:

PowerScope #7 4160V E.S. B

Phase A voltage	<u>20</u>	volts/div
Phase B voltage	<u>20</u>	volts/div
Phase C voltage	<u>20</u>	volts/div

PowerScope #8 480V E.S. B

Phase A voltage	<u>20</u>	volts/div
Phase B voltage	<u>20</u>	volts/div
Phase C voltage	<u>20</u>	volts/div

PowerScope #9 480V MCC 3B3

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #10 480V MCC 3AB

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #11 480V MCC 3B1

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #12 480V MCC 3B2

Phase A voltage	<u>80</u>	volts/div
Phase B voltage	<u>80</u>	volts/div
Phase C voltage	<u>80</u>	volts/div
120V Relay Coil	<u>25</u>	volts/div

PowerScope #13 EGDG-1B OUTPUT

Phase A voltage	<u>20</u>	volts/div
Phase B voltage	<u>20</u>	volts/div
Phase C voltage	<u>20</u>	volts/div

Visicorder #2 4160V E.S. B

Phase A voltage	<u>1.378</u>	volts/mm
Phase B voltage	<u>1.378</u>	volts/mm
Phase C voltage	<u>1.378</u>	volts/mm

4.0 Connect PowerScopes as follows:

Connect PowerScope #7 to the 4160 Volt Engineered Safeguards Bus 3B PT's secondary to record a phase to neutral voltage for each phase.

Installed by: William Cox Date: 11/18/91

Independent Verification: S. Cox Date: 11-18-91

Connect PowerScope #8 to the 480 Volt Engineered Safeguards Bus 3B PT's secondary to record a phase to neutral voltage for each phase.

Installed by: William Cox Date: 11/18/91

Independent Verification: S. Cox Date: 11-18-91

Connect three channels of PowerScope #9 to the 480 Volt ES MCC 3B3, Unit 7AC to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the Unit 2KN CPT secondary or the coil of Relay 42/M.

Installed by: Brian Grubbs Date: 11-16-91

Independent Verification: J. Kinn Date: 11-16-91

Connect three channels of PowerScope #10 to the 480 Volt ES MCC 3AB, Unit 1A to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the Unit 3C CPT secondary or the coil of Relay 42/7MF.

Installed by: Brian Grubbs Date: 11-16-91

Independent Verification: J. Kinn Date: 11-16-91

ENCLOSURE 2
(Page 4 of 4)

Connect three channels of PowerScope #11 to the 480 Volt ES MCC 3B1, Unit 1A to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the Unit 3D CPT secondary or the coil of Relay 42/8M.

Installed by: Brian Milleson Date: 11-15-91

Independent Verification: DJ Kinn Date: 11-15-91

Connect three channels of PowerScope #12 to the 480 Volt ES MCC 3B2, Unit 6A to record each phase to neutral voltage. As directed by the System Engineer, connect the fourth channel across the Unit 6B CPT secondary or the coil of Relay 42/12MF.

Installed by: Brian Milleson Date: 11-16-91

Independent Verification: DJ Kinn Date: 11-16-91

Connect PowerScope #13 to the EGDG-1B 4160 Volt Generator output PT's secondary to record a phase to neutral voltage for each phase.

Installed by: William Cox Date: 11-18-91

Independent Verification: S. Cox Date: 11-18-91

Connect Visicorder #2 to the 4160 Volt Engineered Safeguards Bus 3B PT's secondary to record a phase to neutral voltage for each phase.

Installed by: William Cox Date: 11-18-91

Independent Verification: S. Cox Date: 11-18-91

EDG-A BLOCK 1 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

NOTE: Powerscope #1, 2, 3, 4 and 5 Block 1 data is being recorded here for INFORMATION ONLY and is not considered part of the Acceptance Criteria, due to the inability to determine the Voltage Dip starting point at these voltage levels.

POWER SCOPE	PHASE A			PHASE B			PHASE C			42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Numb of Divs.	Calcu- lated Volts
1	MAX	20	35			20	35			20		
	MIN	20	35			20	35			20		
	60%	20	35			20	35			20		
2	MAX	20	4			20	4			20		
	MIN	20	4			20	4			20		
	60%	20	4			20	4			20		
3	MAX	80	N/A			80	N/A			80		
	MIN	80	N/A			80	N/A			80		
	60%	80	N/A			80	N/A			80		
3A	MAX											
	MIN											
	60%											
4	MAX	80	N/A			80	N/A			80		
	MIN	80	N/A			80	N/A			80		
	60%	80	N/A			80	N/A			80		
5	MAX	80	N/A			80	N/A			80		
	MIN	80	N/A			80	N/A			80		
	60%	80	N/A			80	N/A			80		
6	MAX	20	35			20	35			20		
	MIN	2.556	35	3098.99	2.546	20	35	3088.86	2.532	20		3089.89
	60%	3.754	35	4551.49	3.758	20	35	4556.33	3.693	20		4472.52

* ASIDE CALIPER CT1234 A

EDG-A BLOCK 2 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
1	MAX	20	35			20	35			20	35				
	MIN	2.638	35	3198.41	2.638	20	35	3198.41	2.702	20	35	3276.00			
	60%	3.120	35	3782.10	3.400	20	35	4122.25	3.446	20	35	478.05			
2	MAX	20	4			20	4			20	4				
	MIN	2.646	4	366.64	2.667	20	4	369.55	2.649	20	4	367.06			
	60%	3.449	4	477.91	3.425	20	4	474.58	3.442	20	4	476.94			
3	MAX	80	N/A			80	N/A			80	N/A			25	
	MIN	80	N/A			80	N/A		2.880	80	N/A	399.06	3.709	25	92.73
	60%	80	N/A			80	N/A		3.212	80	N/A	445.07	4.833	25	121.38
3A	MAX													25	
	MIN												3.650	25	91.25
	60%												4.886	25	122.15
4	MAX	80	N/A			80	N/A			80	N/A			25	
	MIN	2.613	N/A	362.07	2.613	80	N/A	362.07	2.685	80	N/A	372.04		25	
	60%	3.435	N/A	475.97	3.414	80	N/A	473.06	3.435	80	N/A	475.97		25	
5	MAX	80	N/A			80	N/A			80	N/A			25	
	MIN	2.605	N/A	360.96	2.605	80	N/A	360.96	2.605	80	N/A	360.96		25	
	60%	3.372	N/A	462.93	3.421	80	N/A	474.03	3.399	80	N/A	470.98		25	
6	MAX	20	35			20	35			20	35				
	MIN	2.638	35	3198.41	2.642	20	35	3203.25	2.635	20	35	3194.77			
	60%	3.449	35	4167.14	3.491	20	35	4232.61	3.464	20	35	4199.88			

EDGE-A BLOCK J STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
1	MAX	/	20	35	/	20	35	/	/	20	35	/	/	/	/
	MIN	2.905	20	35	2.831	20	35	3432.41	2.912	20	35	3530.61	4.120	25	103.00
	60%	3.393	20	35	3.379	20	35	4016.82	3.446	20	35	4178.05	4.883	25	122.08
2	MAX	/	20	4	/	20	4	/	/	20	4	/	/	/	/
	MIN	2.558	20	4	2.912	20	4	403.50	2.947	20	4	408.35	4.120	25	103.00
	60%	3.414	20	4	3.386	20	4	469.18	3.396	20	4	470.58	4.883	25	122.08
3	MAX	/	80	N/A	/	80	N/A	/	/	80	N/A	/	/	/	/
	MIN	2.830	80	N/A	/	80	N/A	3592.06	2.822	80	N/A	391.03	4.120	25	103.00
	60%	3.341	80	N/A	/	80	N/A	462.94	3.248	80	N/A	450.06	4.883	25	122.08
3A	MAX	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	MIN	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	60%	/	/	/	/	/	/	/	/	/	/	/	/	/	/
4	MAX	/	80	N/A	/	80	N/A	/	/	80	N/A	/	/	/	/
	MIN	2.937	80	N/A	2.952	80	N/A	409.04	2.937	80	N/A	406.96	4.114	25	102.83
	60%	3.359	80	N/A	3.399	80	N/A	470.98	3.457	80	N/A	479.02	4.725	25	118.13
5	MAX	/	80	N/A	/	80	N/A	/	/	80	N/A	/	/	/	/
	MIN	2.937	80	N/A	2.930	80	N/A	405.99	2.872	80	N/A	397.96	4.114	25	102.83
	60%	3.399	80	N/A	3.385	80	N/A	469.04	3.392	80	N/A	470.01	4.725	25	118.13
6	MAX	/	20	35	/	20	35	/	/	20	35	/	/	/	/
	MIN	2.587	20	35	2.894	20	35	3508.79	2.850	20	35	3491.81	4.120	25	103.00
	60%	3.478	20	35	3.440	20	35	4170.78	3.468	20	35	4204.73	4.883	25	122.08

EDG-A BLOCK 4 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE		PHASE A				PHASE B				PHASE C				42/COIL		
		Numb of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Numb of Divs.	Volts per Div.	Calculated Volts
1	MAX	/	20	35	/	/	20	35	/	/	20	35	/			
	MIN	2.842	20	35	3445.74	2.786	20	35	3377.85	2.842	20	35	3445.74			
	60%	3.246	20	35	3935.57	3.211	20	35	3893.13	3.211	20	35	3893.13			
2	MAX	/	20	4	/	/	20	4	/	/	20	4	/			
	MIN	2.898	20	4	401.56	2.860	20	4	396.29	2.870	20	4	397.68			
	60%	3.274	20	4	453.66	3.274	20	4	453.66	3.217	20	4	445.76			
3	MAX	/	80	N/A	/	/	80	N/A	/	/	80	N/A	/	/	25	/
	MIN	2.858	80	N/A	396.02	/	80	N/A	/	3.240	80	N/A	448.95	4.031	25	100.78
	60%	3.370	80	N/A	466.96	/	80	N/A	/	3.428	80	N/A	475.00	4.617	25	115.43
3A	MAX													/	25	/
	MIN													3.993	25	99.81
	60%													4.550	25	113.75
4	MAX	/	80	N/A	/	/	80	N/A	/	/	80	N/A	/	/	25	/
	MIN	2.822	80	N/A	391.02	2.843	80	N/A	393.94	2.880	80	N/A	399.06	/	25	/
	60%	3.464	80	N/A	479.99	3.363	80	N/A	465.99	3.435	80	N/A	475.97	/	25	/
5	MAX	/	80	N/A	/	/	80	N/A	/	/	80	N/A	/	/	25	/
	MIN	2.851	80	N/A	395.05	2.851	80	N/A	395.05	2.851	80	N/A	395.05	/	25	/
	60%	3.233	80	N/A	447.98	3.428	80	N/A	475.00	3.435	80	N/A	475.97	/	25	/
6	MAX	/	20	35	/	/	20	35	/	/	20	35	/			
	MIN	2.833	20	35	3434.83	2.778	20	35	3368.15	2.792	20	35	3385.12			
	60%	3.242	20	35	3930.72	3.232	20	35	3918.59	3.201	20	35	3881.01			

EDG-A BLOCK 5 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	MAX	MIN	60%	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
1	MAX					20	35			20	35				
	MIN	3.221		3905.25	3.060	20	35	3710.05	3.232	20	35	3918.59			
	60%	3.251		3900.13	3.277	20	35	3973.15	3.351	20	35	4082.87			
2	MAX					20	4			20	4				
	MIN	3.263		452.13	3.246	20	4	449.78	3.246	20	4	449.78			
	60%	3.351		464.33	3.288	20	4	455.60	3.361	20	4	465.71			
3	MAX					80	N/A			80	N/A				
	MIN	3.161		438.00		80	N/A		3.053	80	N/A	423.04	4.535	25	113.28
	60%	3.450		473.95		80	N/A		3.435	80	N/A	475.97	4.638	25	115.95
3A	MAX														
	MIN														
	60%														
4	MAX					80	N/A			80	N/A				
	MIN	3.219		446.04	3.197	80	N/A	442.57	3.219	80	N/A	446.04			
	60%	3.341		462.94	3.269	80	N/A	452.97	3.320	80	N/A	460.03			
5	MAX					80	N/A			80	N/A				
	MIN	3.212		445.07	3.212	80	N/A	445.07	3.212	80	N/A	445.07			
	60%	3.305		457.25	3.305	80	N/A	457.25	3.320	80	N/A	460.03			
6	MAX					20	35			20	35				
	MIN	3.205		3985.36	3.218	20	35	3901.62	3.195	20	35	3873.73			
	60%	3.313		4016.80	3.296	20	35	3996.19	3.293	20	35	3992.55			

EDG-A BLOCK 6 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	MAX	MIN	60%	Calcu- lated Volts	PT Ratio	Volts per Div.	Numb of Divs.	Calcu- lated Volts	PT Ratio	Volts per Div.	Numb of Divs.	Calcu- lated Volts	Volts per Div.	Numb of Divs.	Calcu- lated Volts
1	MAX				35	20			35	20					
	MIN	3.044		3590.65	35	20	3.098	3726.13	35	20	3.098	3726.13			
	60%	3.351		4062.87	35	20	3.333	4041.05	35	20	3.351	4042.87			
2	MAX				4	20			4	20					
	MIN	3.123		432.74	4	20	3.123	432.74	4	20	3.123	432.74			
	60%	3.379		468.21	4	20	3.361	463.71	4	20	3.373	470.15			
3	MAX				N/A	80			N/A	80					
	MIN	3.000		415.69	N/A	80			N/A	80				1,372	109.30
	60%	3.310		458.65	N/A	80			N/A	80				4,322	120.13
3A	MAX														
	MIN														
	60%														
4	MAX				N/A	80			N/A	80					
	MIN	3.038		420.96	N/A	80	3.038	420.96	N/A	80	3.125	433.01			
	60%	3.305		457.95	N/A	80	3.327	461.00	N/A	80	3.370	466.96			
5	MAX				N/A	80			N/A	80					
	MIN	3.038		420.26	N/A	80	3.038	420.96	N/A	80	3.038	420.96			
	60%	3.356		465.02	N/A	80	3.320	460.03	N/A	80	3.320	460.03			
6	MAX				35	20			35	20					
	MIN	3.130		3794.92	35	20	3.120	3782.80	35	20	3.130	3794.92			
	60%	3.392		4112.58	35	20	3.300	4001.04	35	20	3.324	4030.14			

VISCORDER FREQUENCY RESPONSE AT THE 60% TIME INTERVAL MARK

NOTE: This measurement is to be made at the tenth of a second interval in which the 60% time interval occurs.

VISCORDER FREQUENCY			
BLOCK NUMB	PHASE A	PHASE B	PHASE C
BLOCK #1	60.15	60.00	60.70
BLOCK #2	59.40	59.30	59.50
BLOCK #3	59.66	59.56	59.55
BLOCK #4	59.61	59.56	59.67
BLOCK #5	59.54	59.47	59.46
BLOCK #6	59.70	59.80	59.70

Enclosure 3 Calculations Performed By: W. Kelleff Date: 12/6/91

Independent Verification By: R. D. Dorman Date: 12-9-91

Attached copies of PowerScope and Viscorder As Found and As Left charts to work package and provide originals to Engineering:

Performed By: R. D. Dorman Date: 12-16-91

EDG-B BLOCK 1 STARTING VOLTAGE PROFILE & 60X TIME INTERVAL MARK

NOTE:

Powerscope #7, 8, 9, 10, 11 and 12 Block 1 data is being recorded here for INFORMATION ONLY and is not considered part of the Acceptance Criteria, due to the inability to determine the Voltage Dip starting point at these voltage levels.

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	MAX	MIN	60X	N/A	Volts per Div.	PT Ratio	Calculated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Numb of Divs.	Volts per Div.	N/A	Calculated Volts
7				N/A	20	35	N/A	N/A	20	35	N/A	N/A			
				2.543	20	35	3082.51	2.536	20	35	3074.54	2.536	20		
				3.696	20	35	4291.11	3.539	20	35	4286.97	3.539	20		
8				N/A	20	4	N/A	N/A	20	4	N/A	N/A			
				2.56	20	4	354.72	2.576	20	4	354.72	2.576	20		
				3.471	20	4	480.95	3.471	20	4	480.95	3.471	20		
9				N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A	
					80	N/A		2.594	80	N/A	359.43		80		N/A
					80	N/A		3.526	80	N/A	488.52		80		N/A
10				N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A	
					80	N/A		2.522	80	N/A	349.46		80		N/A
					80	N/A		3.491	80	N/A	483.79		80		N/A
11				N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A	
					80	N/A			80	N/A			80		N/A
					80	N/A			80	N/A			80		N/A
12				N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A	
				2.584	80	N/A	358.05	2.584	80	N/A	358.05	2.584	80		N/A
					80	N/A		3.447	80	N/A	427.64	3.447	80		N/A
13				N/A	20	35	N/A	N/A	20	35	N/A	N/A	25	N/A	
				2.546	20	35	3086.86	2.546	20	35	3086.86	2.546	20		N/A
				3.741	20	35	4536.24	3.683	20	35	4510.43	3.683	20		N/A

* B SIDE CALIPER CT 1221B

ED6-B BLOCK 2 STARTING VOLTAGE PROFILE & 60X TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
7	MAX	N/A	20	N/A	N/A	20	35	N/A	N/A	20	35	N/A			
	MIN	2.505	20	3037.29	2.505	20	35	3037.29	2.526	20	35	3062.12			
	60X	3.287	20	3984.89	3.369	20	35	4084.21	3.348	20	35	4059.38			
8	MAX	N/A	20	N/A	N/A	20	4	N/A	N/A	20	4	N/A			
	MIN	2.498	20	346.17	2.498	20	4	346.17	2.498	20	4	346.17			
	60X	3.389	20	469.60	3.389	20	4	469.60	3.389	20	4	469.60			
9	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A			
	MIN	2.536	80	351.38	2.536	80	N/A	351.38	2.536	80	N/A	351.38	N/A	25	N/A
	60X	3.433	80	475.75	3.433	80	N/A	475.75	3.433	80	N/A	475.75	3.509	25	82.71
10	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	4.666	25	116.64
	MIN	2.536	80	351.38	2.536	80	N/A	351.38	2.481	80	N/A	343.81	N/A	25	86.1
	60X	3.031	80	420.04	3.341	80	N/A	462.48	3.324	80	N/A	460.62	4.778	25	119.45
11	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	2.522	80	349.48	2.392	80	N/A	331.51	2.464	80	N/A	341.45	3.584	25	89.59
	60X	3.403	80	471.50	3.403	80	N/A	471.50	3.403	80	N/A	471.50	4.775	25	119.37
12	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	2.474	80	342.8	2.498	80	N/A	346.13	2.515	80	N/A	348.48	3.577	25	89.425
	60X	3.307	80	458.26	3.307	80	N/A	458.26	3.307	80	N/A	458.26	4.744	25	118.60
13	MAX	N/A	20	N/A	N/A	20	35	N/A	N/A	20	35	N/A			
	MIN	2.543	20	3083.22	2.529	20	35	3066.25	2.56	20	35	3103.83			
	60X	3.345	20	4055.25	3.349	20	35	4121.45	3.44	20	35	4171.11			

ENGINEERED SAFELY "B" SIDE
BLOCK LOADING VOLTAGE MEASUREMENTS

LOSURE 4
(page 3 of 7)

EDG-B BLOCK 3 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
7	MAX	N/A	35	N/A	N/A	20	35	N/A	N/A	20	35	N/A			
	MIN		35		2.792	20	35	3384.88	2.782	20	35	3372.47			
	60%		35		3.331	20	35	4038.62	3.672	20	35	4452.49			
8	MAX	N/A	4	N/A	N/A	20	4	N/A	N/A	20	4	N/A			
	MIN	2.799	4	387.79	2.799	20	4	387.79	2.799	20	4	387.79			
	60%	3.249	4	450.22	3.249	20	4	450.22	3.249	20	4	450.22			
9	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	2.802	N/A	388.26	2.802	80	N/A	388.26	2.802	80	N/A	388.26	3.881	25	97.014
	60%	3.331	N/A	461.67	3.331	80	N/A	461.67	3.331	80	N/A	461.67	4.594	25	114.85
10	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	2.741	N/A	379.80	2.741	80	N/A	379.80	2.823	80	N/A	391.17	4.00	25	100
	60%	3.341	N/A	462.98	3.259	80	N/A	451.58	3.314	80	N/A	459.2	4.713	25	117.83
11	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	2.741	N/A	379.8	2.741	80	N/A	379.8	2.741	80	N/A	379.8	4.00	25	100
	60%	3.341	N/A	458.26	3.341	80	N/A	458.26	3.672	80	N/A	458.26	4.754	25	118.86
12	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	2.76	N/A	382.43	2.795	80	N/A	387.31	2.805	80	N/A	388.67	4.00	25	100.0
	60%	3.338	N/A	462.51	3.338	80	N/A	462.51	3.338	80	N/A	462.51	4.659	25	116.47
13	MAX	N/A	35	N/A	N/A	20	35	N/A	N/A	20	35	N/A			
	MIN	2.763	35	3349.95	2.802	20	35	3397.24	2.788	20	35	3380.27			
	60%	3.355	35	4607.66	3.321	20	35	4030.42	3.352	20	35	4063.52			

EDG-B BLOCK 4 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
7	MAX	N/A	35	N/A	N/A	20	35	N/A	N/A	20	35	N/A	N/A		
	MIN		35		3.171	20	35	384.421	3.160	20	35	383.79			
	60%		35		3.314	20	35	408.00	3.495	20	35	423.732			
8	MAX	N/A	4	N/A	N/A	20	4	N/A	N/A	20	4	N/A	N/A		
	MIN	3.147	4	436.03	3.147	20	4	436.03	3.147	20	4	436.03			
	60%	3.27	4	453.05	3.27	20	4	453.05	3.27	20	4	453.05			
9	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.133	N/A	434.14	3.133	80	N/A	434.14	3.133	80	N/A	434.14	4.345	25	108.62
	60%	3.235	N/A	448.32	3.235	80	N/A	448.32	3.235	80	N/A	448.32	4.451	25	111.26
10	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.130	N/A	433.66	3.092	80	N/A	428.46	3.133	80	N/A	434.14	4.437	25	110.92
	60%	3.348	N/A	463.91	3.188	80	N/A	441.70	3.215	80	N/A	445.49	4.611	25	115.27
11	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.113	N/A	431.3	3.113	80	N/A	431.3	3.113	80	N/A	431.3	4.478	25	111.95
	60%	3.184	N/A	441.23	3.184	80	N/A	441.23	3.184	80	N/A	441.23	4.502	25	112.54
12	MAX	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.102	N/A	429.88	3.102	80	N/A	429.88	3.102	80	N/A	429.88	4.464	25	111.60
	60%	3.184	N/A	441.23	3.184	80	N/A	441.23	3.184	80	N/A	441.23	4.648	25	116.21
13	MAX	N/A	35	N/A	N/A	20	35	N/A	N/A	20	35	N/A	N/A		
	MIN	3.106	35	3765.82	3.061	20	35	3711.79	3.078	20	35	3731.87			
	60%	3.232	35	3918.69	3.270	20	35	3964.66	3.266	20	35	3960.07			

EDG-B BLOCK 5 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/C01L		
	Num of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Num of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Num of Divs.	Volts per Div.	PT Ratio	Calculated Volts	Num of Divs.	Volts per Div.	Calculated Volts
7	MAX	N/A	20	N/A	N/A	20	35	N/A	N/A	20	35	N/A	N/A		
	MIN		20		3.113	20	35	3773.80	3.120	20	35	3782.55			
	60%		20		3.28	20	35	3796.79	3.266	20	35	3760.07			
8	MAX	N/A	20	N/A	N/A	20	4	N/A	N/A	20	4	N/A	N/A		
	MIN	3.0	20	415.69	3.0	20	4	415.69	3.0	20	4	415.69			
	60%	3.246	20	449.74	3.246	20	4	449.74	3.246	20	4	449.74			
9	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	N/A	N/A
	MIN	3.061	80	424.21	3.061	80	N/A	424.21	3.061	80	N/A	424.21	4.276	25	106.91
	60%	3.239	80	448.80	3.239	80	N/A	448.80	3.239	80	N/A	448.80	4.532	25	113.31
10	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	N/A	N/A
	MIN	3.099	80	429.41	3.099	80	N/A	429.41	3.099	80	N/A	429.41	4.345	25	108.62
	60%	3.205	80	444.01	3.205	80	N/A	444.01	3.205	80	N/A	444.01	4.563	25	114.08
11	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	N/A	N/A
	MIN	3.0	80	415.69	3.0	80	N/A	415.69	3.0	80	N/A	415.69	4.352	25	108.79
	60%	3.229	80	447.38	3.229	80	N/A	447.38	3.229	80	N/A	447.38	4.577	25	114.42
12	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	N/A	N/A
	MIN	3.078	80	426.57	3.078	80	N/A	426.57	3.078	80	N/A	426.57	4.444	25	111.10
	60%	3.287	80	455.42	3.287	80	N/A	455.42	3.287	80	N/A	455.42	4.683	25	117.06
13	MAX	N/A	20	N/A	N/A	20	35	N/A	N/A	20	35	N/A	N/A		
	MIN	3.051	20	3699.37	3.051	20	35	3699.37	3.051	20	35	3699.37			
	60%	3.191	20	3869.04	3.208	20	35	3869.49	3.225	20	35	3910.42			

EDG-B BLOCK 6 STARTING VOLTAGE PROFILE & 60% TIME INTERVAL MARK

POWER SCOPE	PHASE A				PHASE B				PHASE C				42/COIL		
	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	PT Ratio	Calcu- lated Volts	Numb of Divs.	Volts per Div.	Calcu- lated Volts
7	MAX	N/A	20	35	N/A	20	35	N/A	N/A	20	35	N/A			
	MIN		20	35	3.113	20	35	3773.86	3.075	20	35	3728.24			
	60%		20	35	3.258	20	35	3976.79	3.253	20	35	3943.52			
8	MAX	N/A	20	4	N/A	20	4	N/A	N/A	20	4	N/A			
	MIN	3.0	20	4	3.0	20	4	415.69	3.0	20	4	415.69			
	60%	3.235	20	4	3.235	20	4	448.32	3.235	20	4	448.32			
9	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.0	80	N/A	3.0	80	N/A	415.69	3.0	80	N/A	415.69	4.212	25	105.29
	60%	3.212	80	N/A	3.212	80	N/A	445.01	3.212	80	N/A	445.01	4.57	25	114.25
10	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.00	80	N/A	3.00	80	N/A	415.69	3.00	80	N/A	415.69	4.242	25	106.05
	60%	3.205	80	N/A	3.205	80	N/A	444.07	3.205	80	N/A	444.07	4.567	25	114.16
11	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.0	80	N/A	3.0	80	N/A	415.69	3.0	80	N/A	415.69	4.201	25	105.03
	60%	3.201	80	N/A	3.201	80	N/A	443.54	3.201	80	N/A	443.54	4.625	25	115.61
12	MAX	N/A	80	N/A	N/A	80	N/A	N/A	N/A	80	N/A	N/A	N/A	25	N/A
	MIN	3.0	80	N/A	3.0	80	N/A	415.69	3.0	80	N/A	415.69	4.30	25	107.51
	60%	3.30	80	N/A	3.30	80	N/A	457.31	3.30	80	N/A	457.31	4.614	25	115.36
13	MAX	N/A	20	35	N/A	20	35	N/A	N/A	20	35	N/A			
	MIN	3.051	20	35	3.051	20	35	3699.37	3.051	20	35	3699.37			
	60%	3.184	20	35	3.229	20	35	3914.55	3.229	20	35	3914.55			

VISICORDER FREQUENCY RESPONSE AT THE 60% TIME INTERVAL MARK

NOTE: This measurement is to be made at the tenth of a second interval in which the 60% time interval occurs.

VISICORDER FREQUENCY			
BLOCK NUMB	PHASE A	PHASE B	PHASE C
BLOCK #1	59.90	59.90	59.90
BLOCK #2	59.82	59.82	59.82
BLOCK #3	59.79	59.79	59.70
BLOCK #4	59.71	59.71	59.59
BLOCK #5	59.90	59.71	59.71
BLOCK #6	60.0	59.68	60.0

60.30 Hz
60.00 Hz

Enclosure 4 Calculations Performed By: R. W. Wermann Date: 11-22-91

Independent Verification By: W. Foreff Date: 12/5/91

Attached copies of PowerScope and Visicorder As Found and As Left charts to work package and provide originals to Engineering:

Performed By: R. W. Wermann Date: 12-16-91

ENCLOSURE 4 (Page 7 of 7)

PS06 EGDG 1A OUTPUT

Nov 18 1991

AN BUS PT VOLTAGE SAG

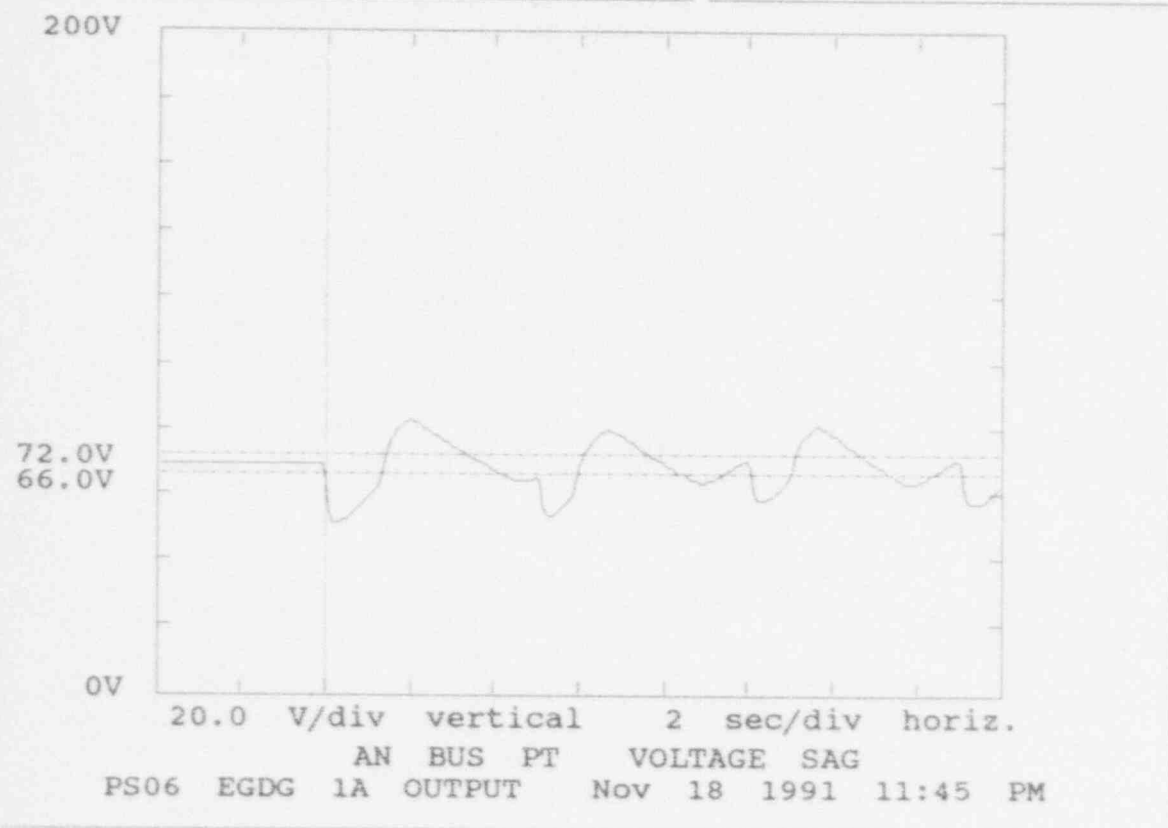
11:43:20.78PM

51.0 Vrms minimum

82.8 Vrms maximum

7.0 seconds below threshold

5.0 seconds above threshold



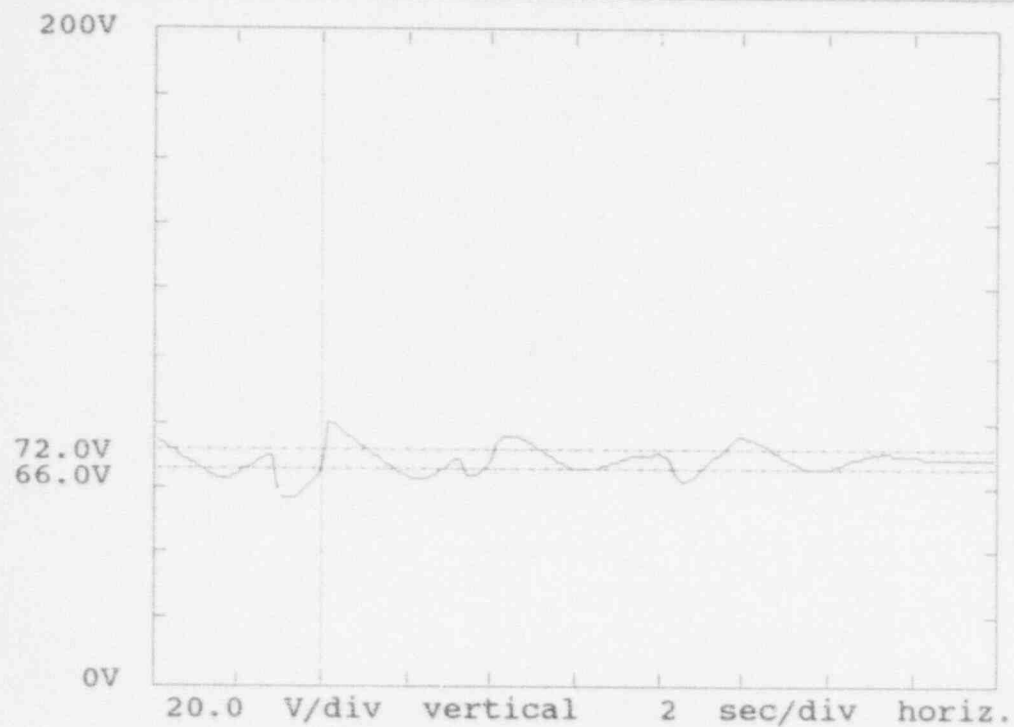
PS06 EGDG 1A OUTPUT

Nov 18 1991

AN BUS PT VOLT. SAG END 11:43:37.08PM

56.6 Vrms minimum

80.9 Vrms maximum



AN BUS PT VOLTAGE SAG ENDED

PS06 EGDG 1A OUTPUT Nov 18 1991 11:48 PM

PS06 EGDG 1A OUTPUT

Nov 18 1991

BN BUS PT VOLTAGE SAG

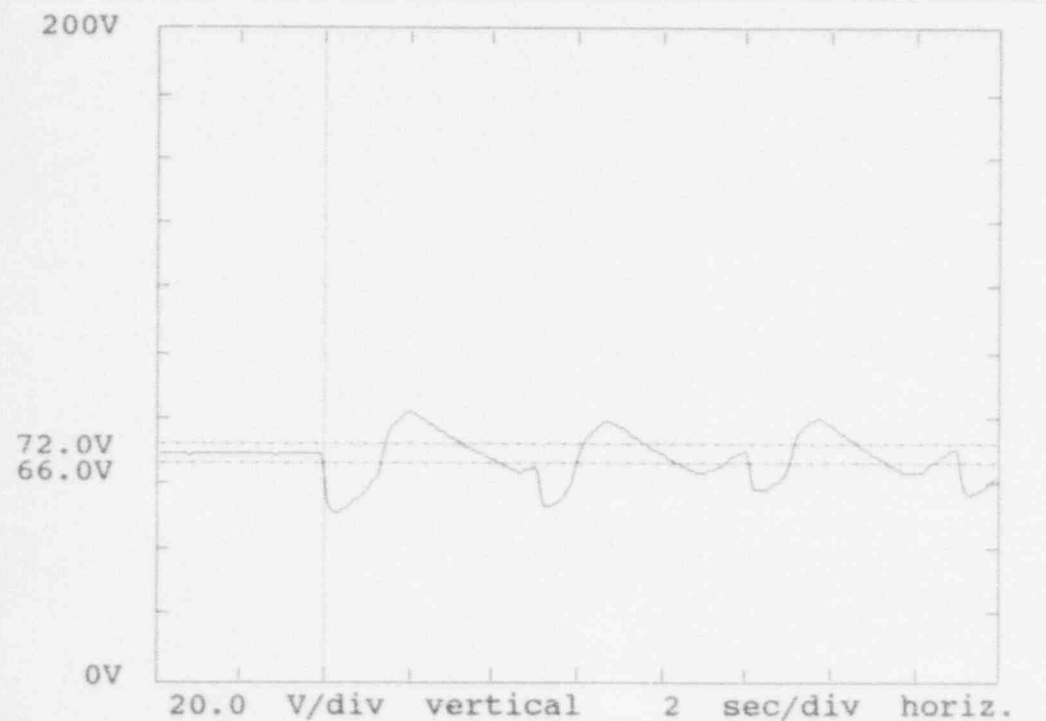
11:43:20.78PM

51.1 Vrms minimum

82.0 Vrms maximum

7.2 seconds below threshold

4.8 seconds above threshold



BN BUS PT VOLTAGE SAG

PS06 EGDG 1A OUTPUT Nov 18 1991 11:44 PM

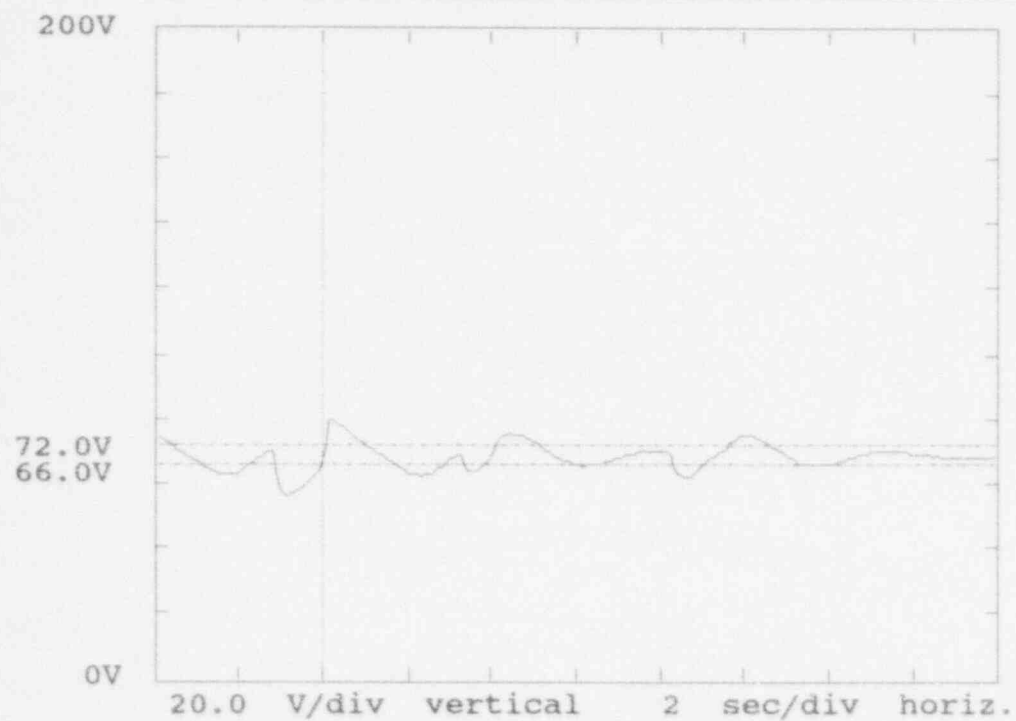
PS06 EGDG 1A OUTPUT

Nov 18 1991

BN BUS PT VOLT. SAG END 11:43:37.06PM

56.2 Vrms minimum

80.0 Vrms maximum



BN BUS PT VOLTAGE SAG ENDED

PS06 EGDG 1A OUTPUT Nov 18 1991 11:47 PM

PS06 EGDG 1A OUTPUT

Nov 18 1991

CN BUS PT VOLTAGE SAG

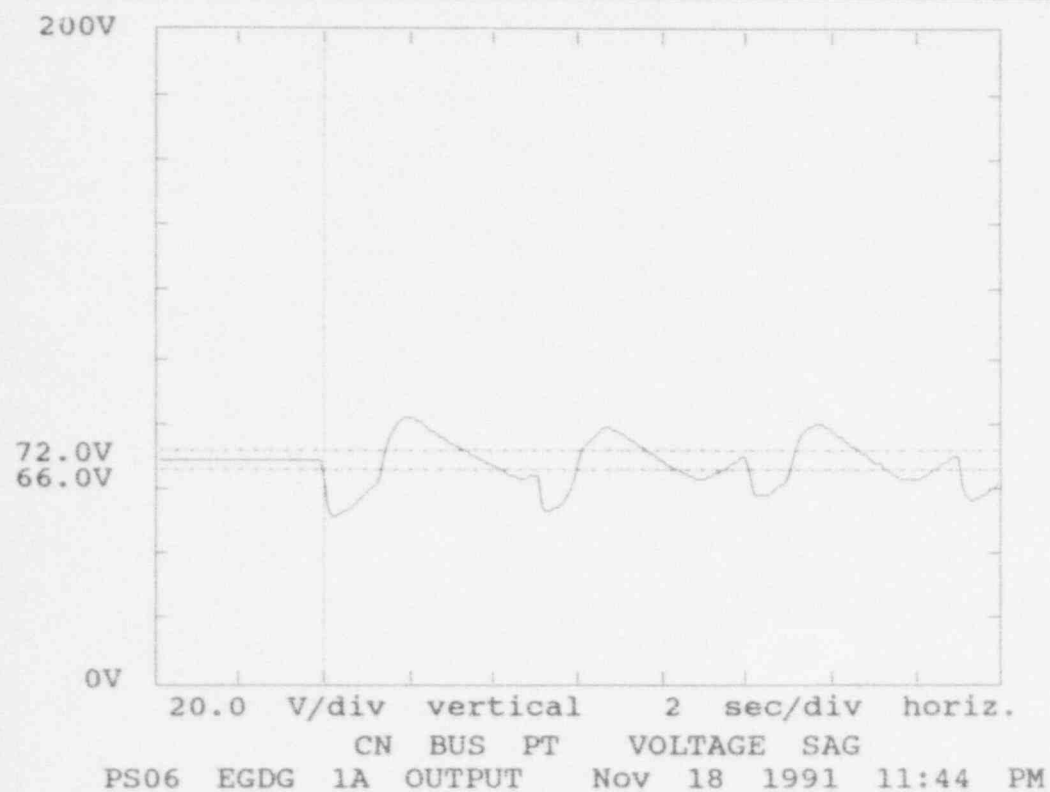
11:43:20.79PM

51.4 Vrms minimum

82.1 Vrms maximum

7.3 seconds below threshold

4.8 seconds above threshold



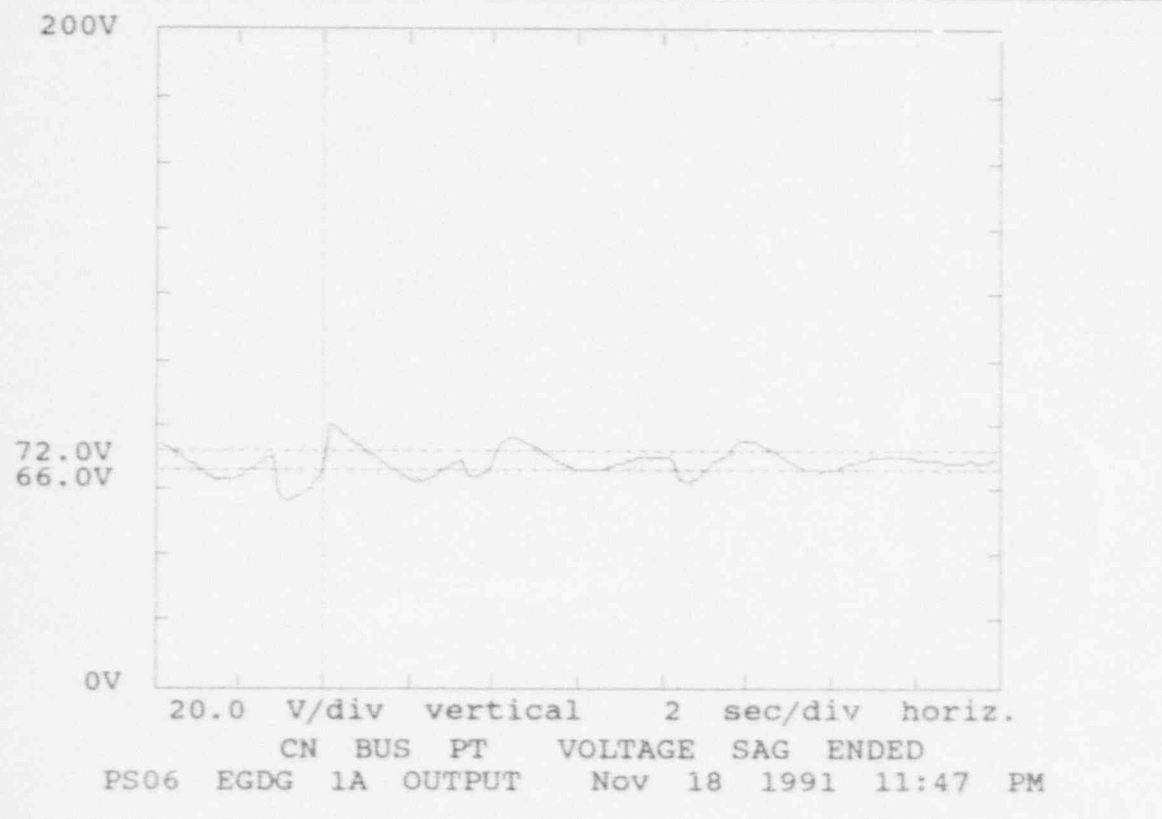
PS06 EGDG 1A OUTPUT

Nov 18 1991

CN BUS PT VOLT. SAG END 11:43:37.07PM

56.3 Vrms minimum

80.3 Vrms maximum

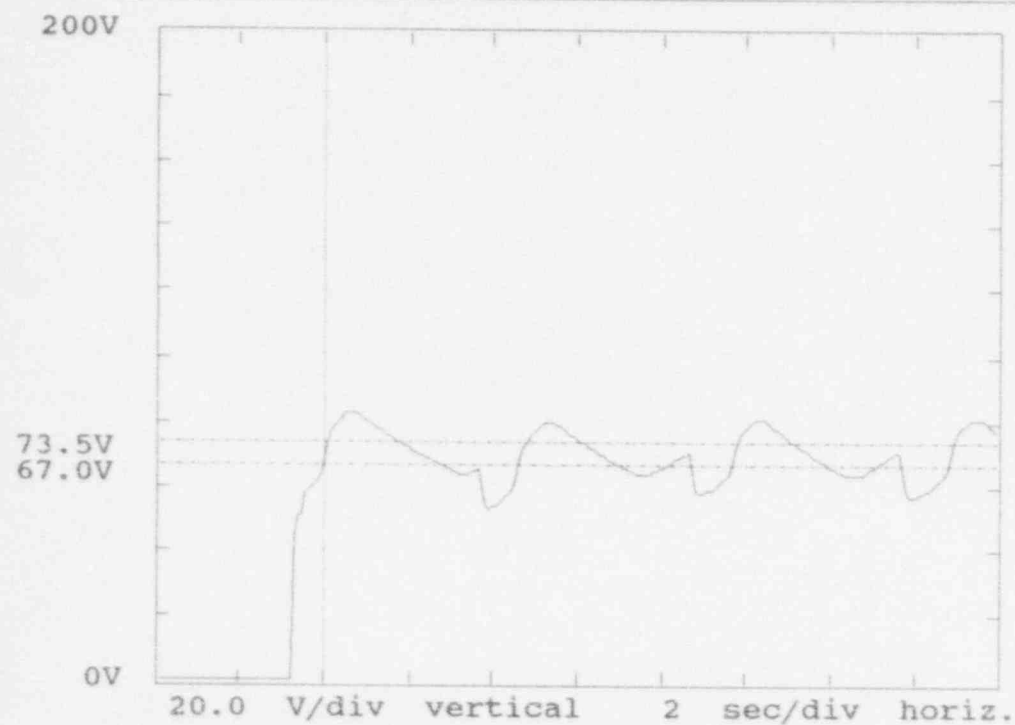


PS01 4160V ES BUS 3A

Nov 18 1991

AN BUS PT VOLT. SAG END 11:43:23.74PM

0.0 Vrms minimum
83.4 Vrms maximum



AN BUS PT VOLTAGE SAG ENDED
PS01 4160V ES BUS 3A Nov 18 1991 11:44 PM

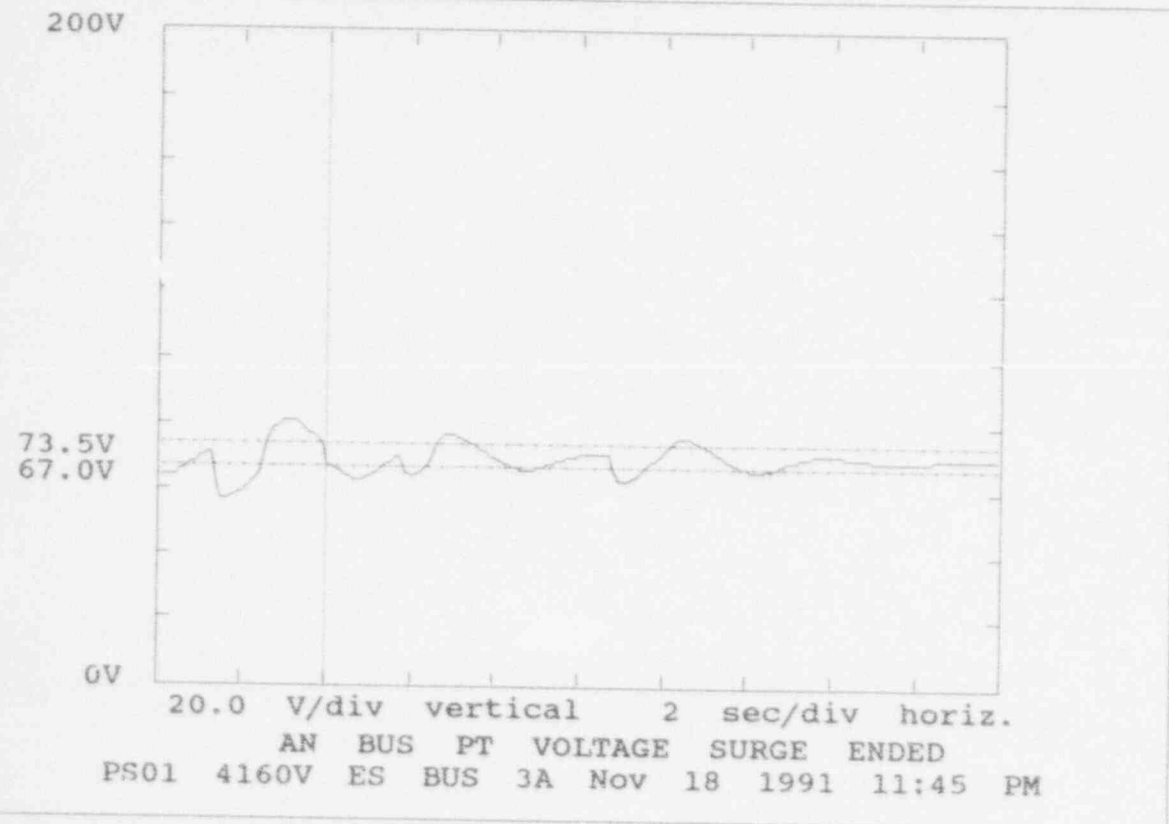
PS01 4160V ES BUS 3A

Nov 18 1991

AN BUS PT VOLT SURGE END 11:43:40.75PM

81.5 Vrms maximum

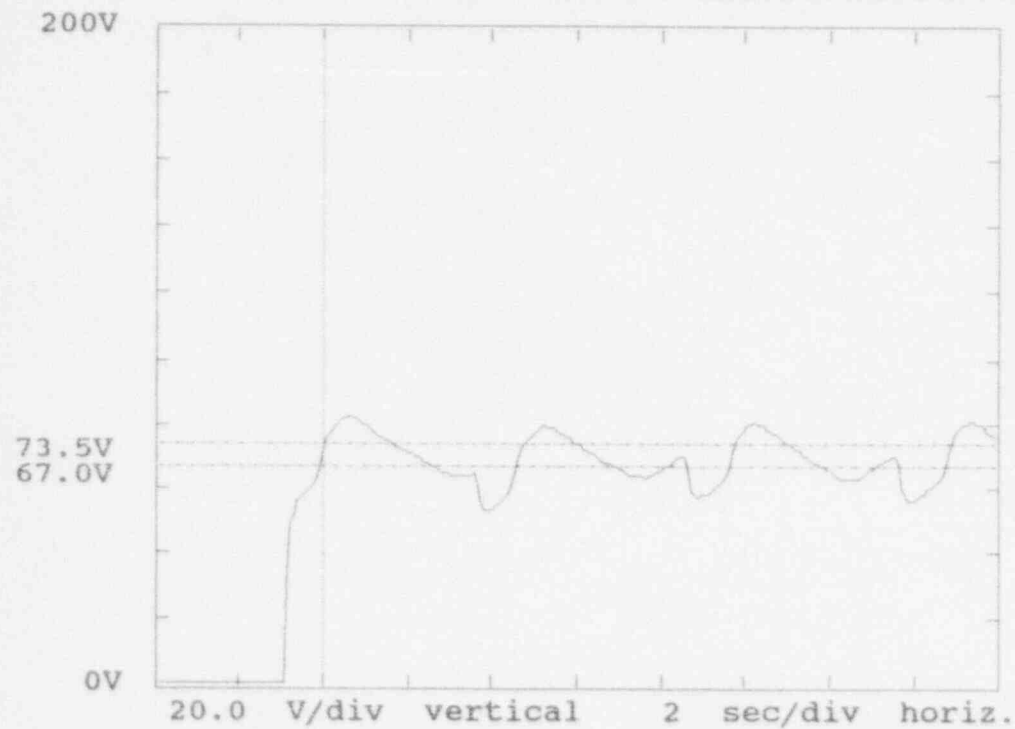
57.0 Vrms minimum



PS01 4160V ES BUS 3A Nov 18 1991

BN BUS PT VOLT. SAG END 11:43:23.80PM

0.0 Vrms minimum
82.7 Vrms maximum



BN BUS PT VOLTAGE SAG ENDED
PS01 4160V ES BUS 3A Nov 18 1991 11:45 PM

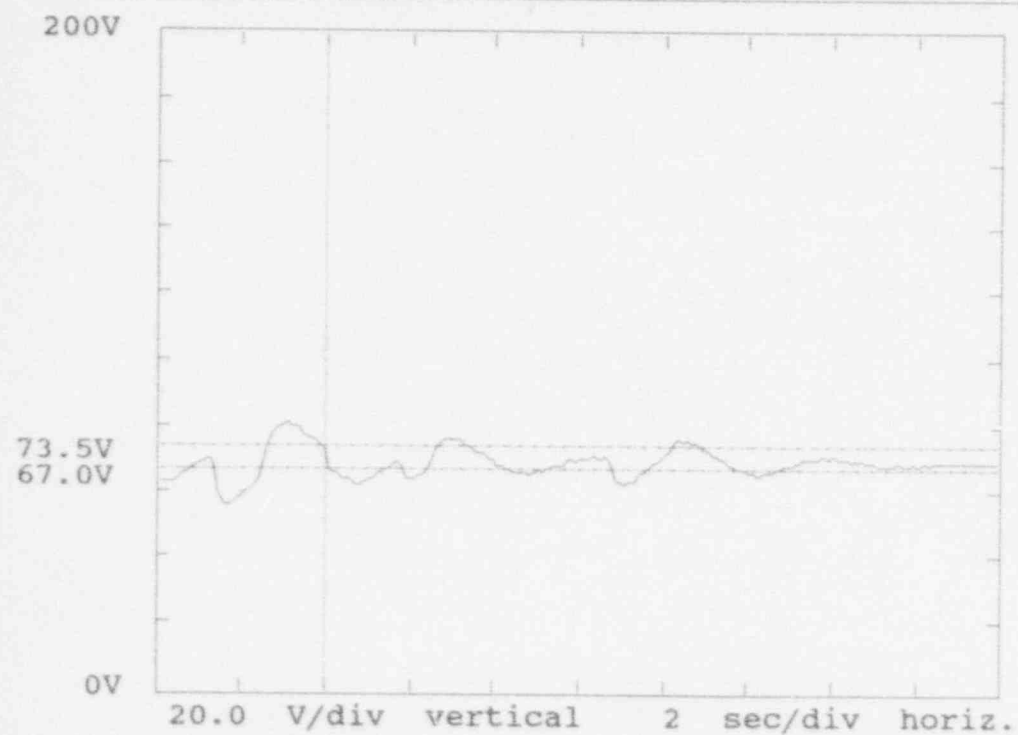
PS01 4160V ES BUS 3A

Nov 18 1991

BN BUS PT VOLT SURGE END 11:43:40.17PM

80.9 Vrms maximum

56.1 Vrms minimum

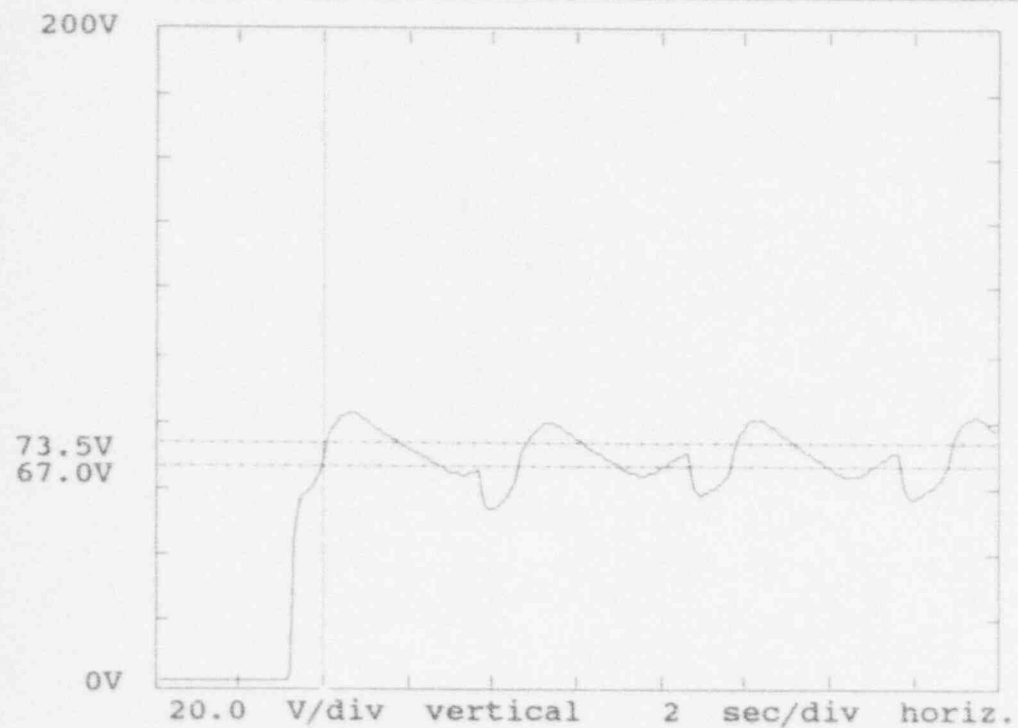


BN BUS PT VOLTAGE SURGE ENDED
PS01 4160V ES BUS 3A Nov 18 1991 11:46 PM

PS01 4160V ES BUS 3A Nov 18 1991

CN BUS PT VOLT. SAG END 11:43:23.75PM

0.0 Vrms minimum
83.5 Vrms maximum



CN BUS PT VOLTAGE SAG ENDED
PS01 4160V ES BUS 3A Nov 18 1991 11:45 PM

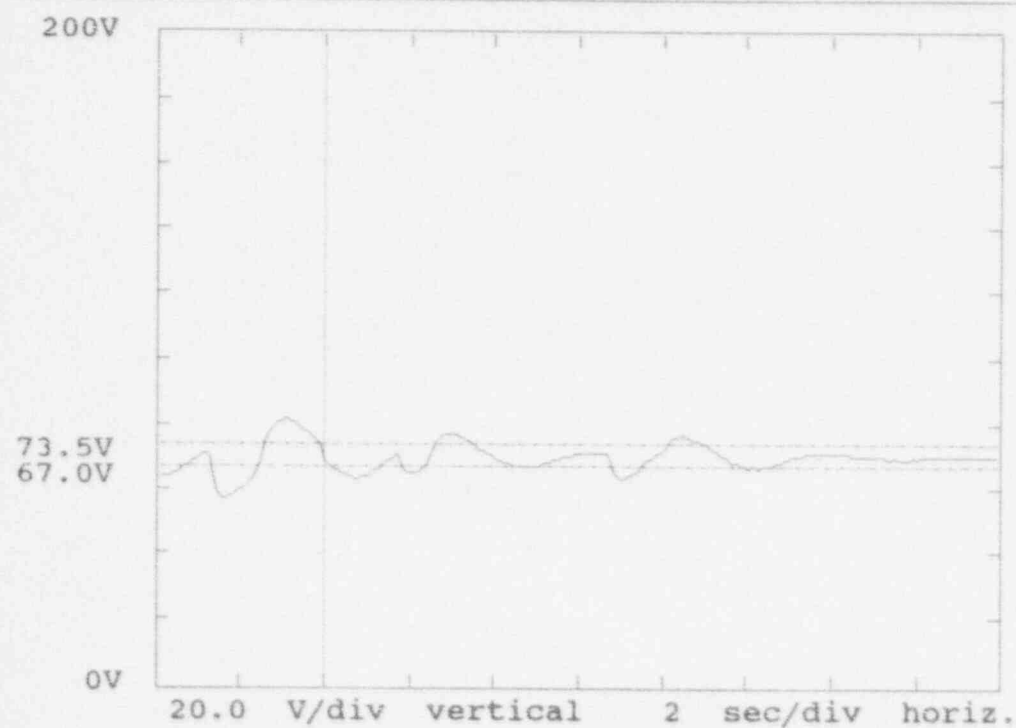
PS01 4160V ES BUS 3A

Nov 18 1991

CN BUS PT VOLT SURGE END 11:43:40.75PM

81.7 Vrms maximum

57.5 Vrms minimum



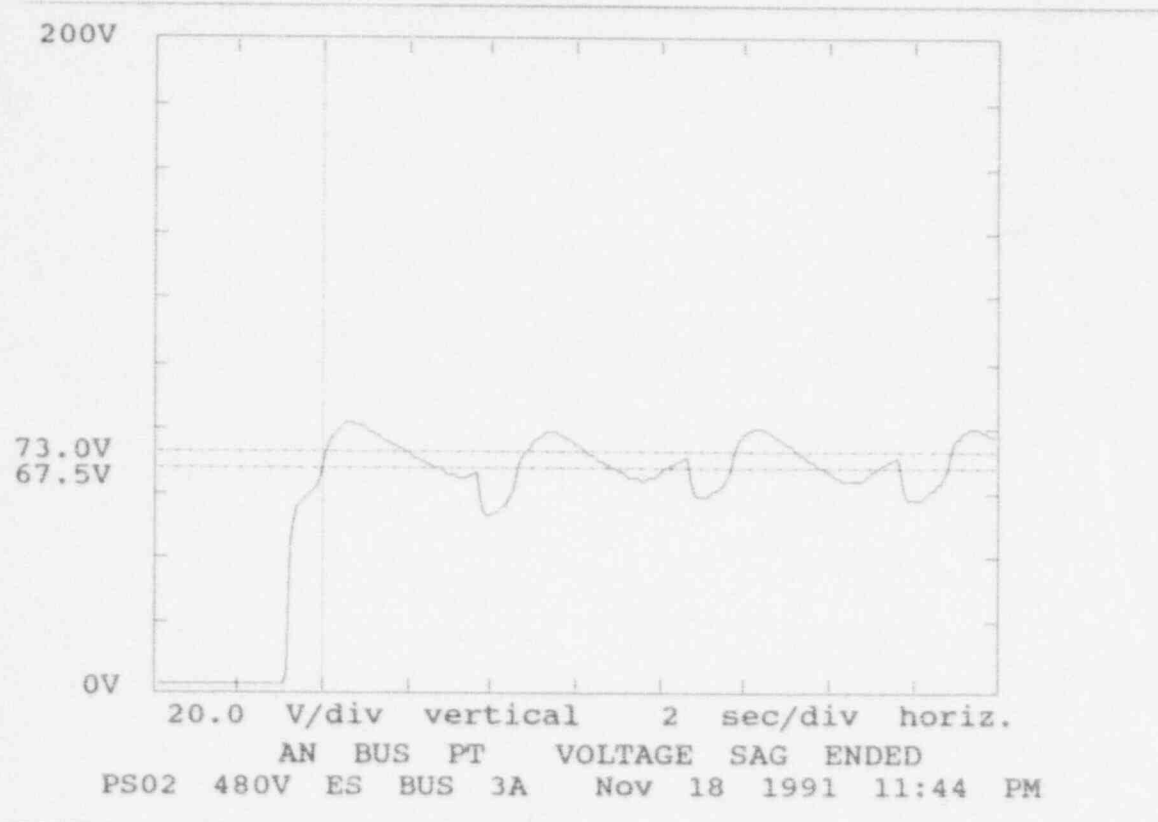
CN BUS PT VOLTAGE SURGE ENDED
PS01 4160V ES BUS 3A Nov 18 1991 11:46 PM

PS02 480V ES BUS 3A

Nov 18 1991

AN BUS PT VOLT. SAG END 11:43:21.25PM

0.7 Vrms minimum
82.1 Vrms maximum



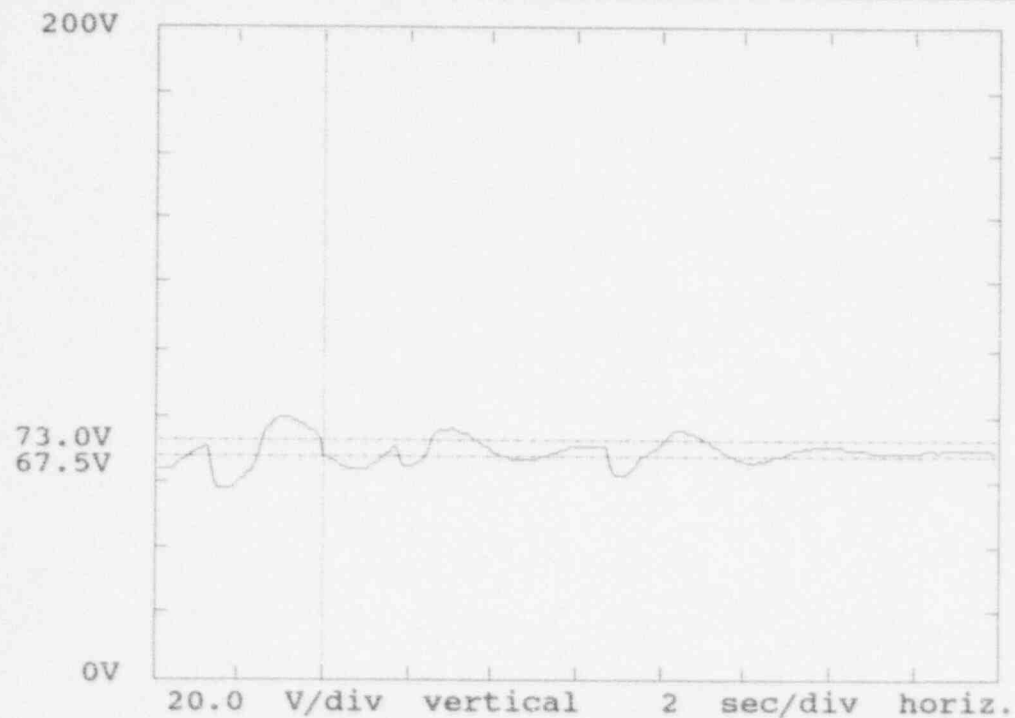
PS02 480V ES BUS 3A

Nov 18 1991

AN BUS PT VOLT SURGE END 11:43:38.26PM

80.5 Vrms maximum

57.7 Vrms minimum



AN BUS PT VOLTAGE SURGE ENDED

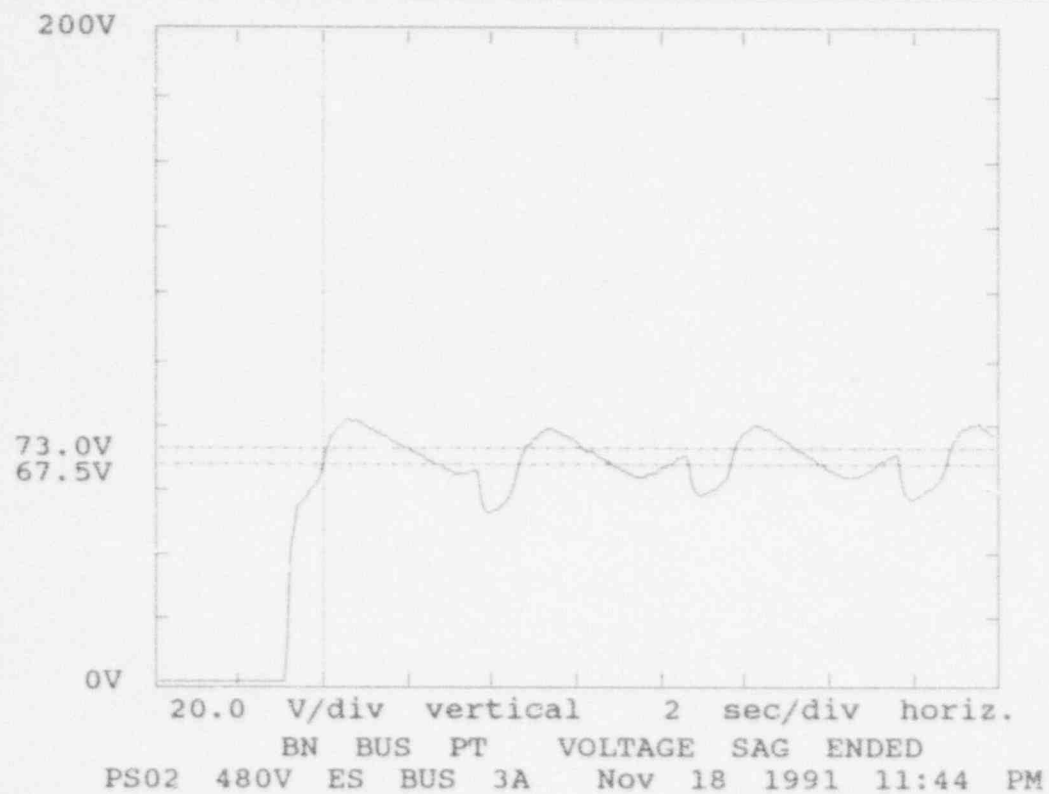
PS02 480V ES BUS 3A Nov 18 1991 11:45 PM

PS02 480V ES BUS 3A

Nov 18 1991

BN BUS PT VOLT. SAG END 11:43:21.27PM

0.0 Vrms minimum
82.0 Vrms maximum



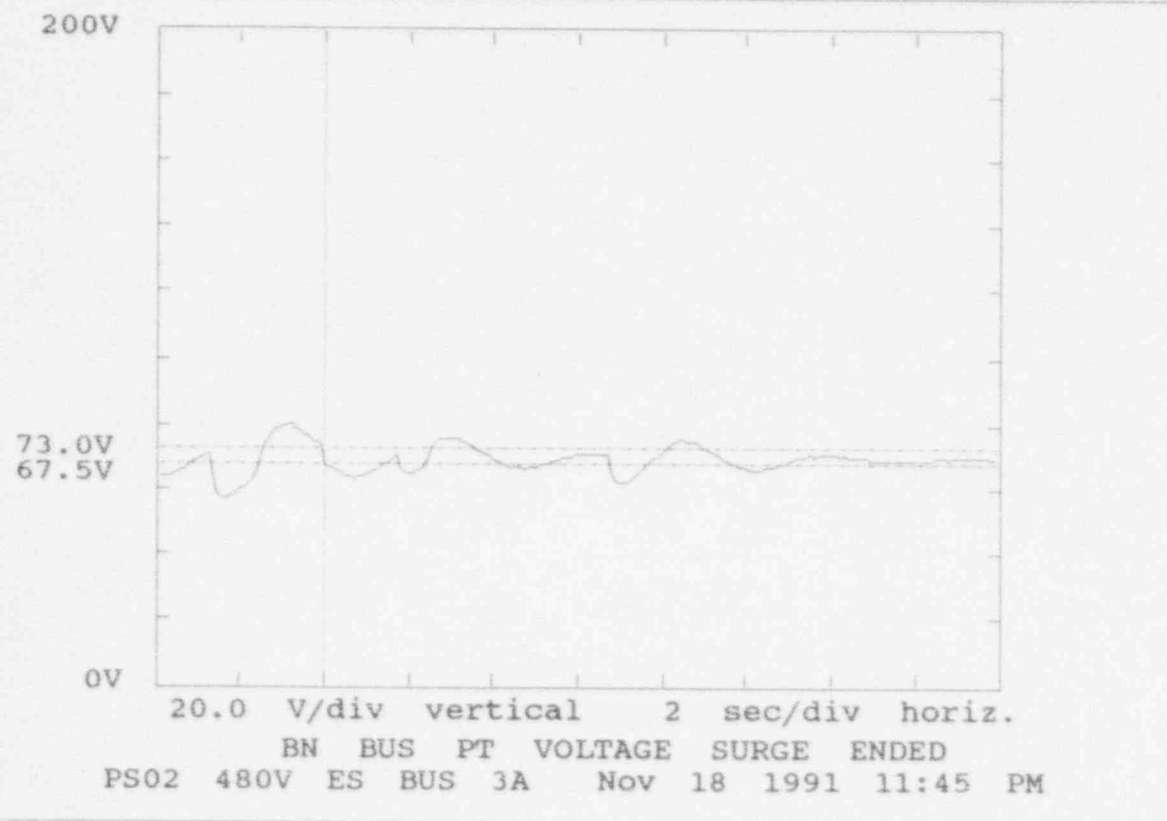
PS02 480V ES BUS 3A

Nov 18 1991

BN BUS PT VOLT SURGE END 11:43:38.26PM

80.7 Vrms maximum

57.5 Vrms minimum



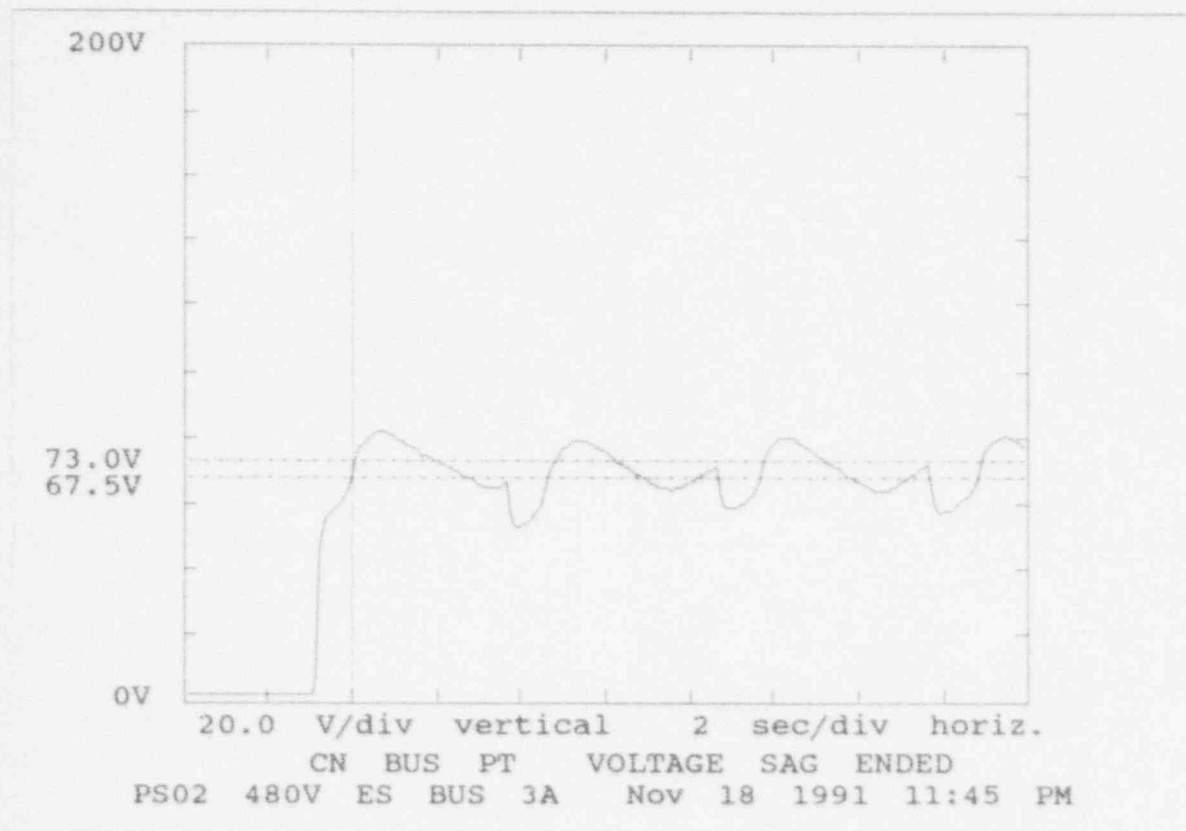
PS02 480V ES BUS 3A

Nov 18 1991

CN BUS PT VOLT. SAG END 11:43:21.25PM

0.5 Vrms minimum

82.4 Vrms maximum



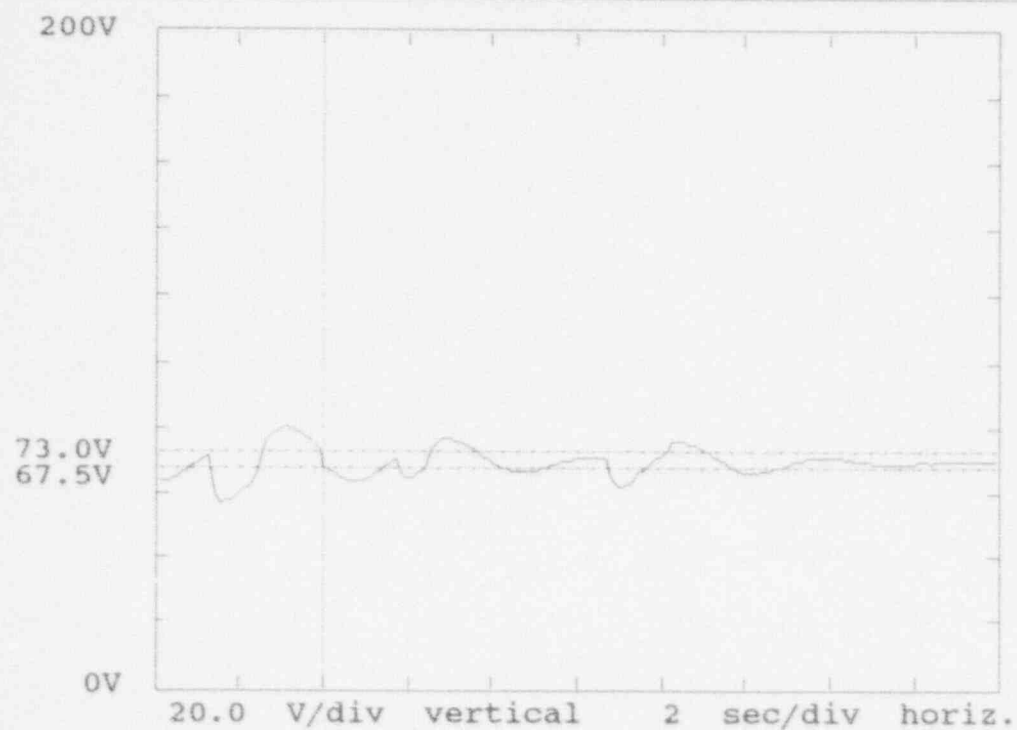
PS02 480V ES BUS 3A

Nov 18 1991

CN BUS PT VOLT SURGE END 11:43:38.27PM

80.6 Vrms maximum

57.5 Vrms minimum



CN BUS PT VOLTAGE SURGE ENDED

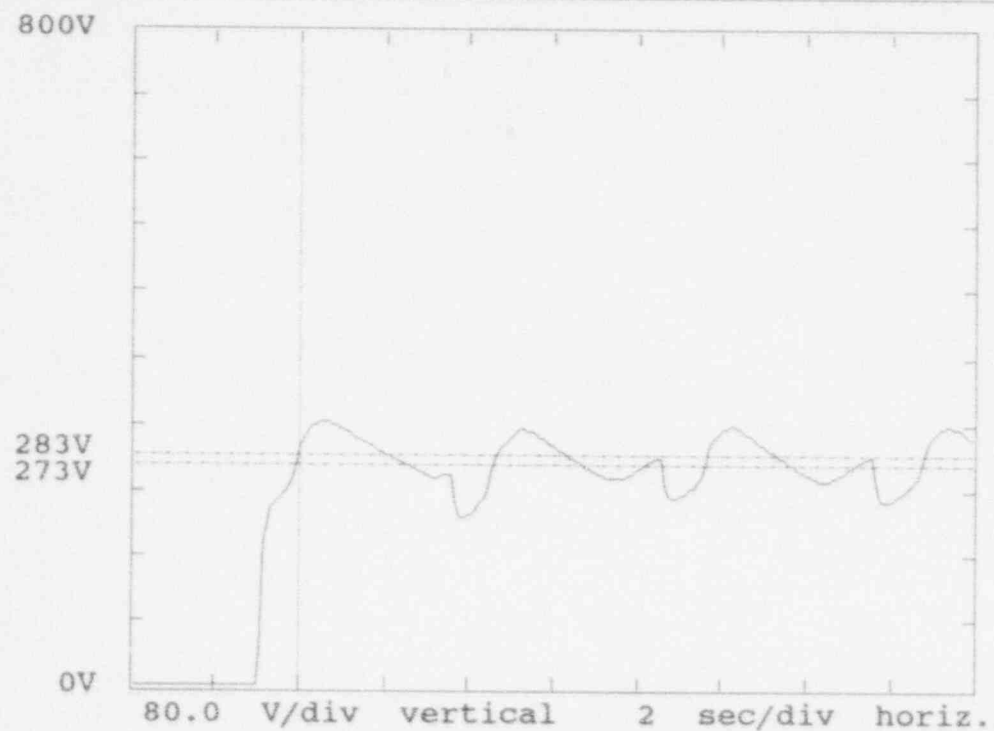
PS02 480V ES BUS 3A Nov 18 1991 11:46 PM

PS05 MCC 3A1

Nov 18 1991

PHASE AN VOLT. SAG END 11:43:08.32PM

0.0 Vrms minimum
325.5 Vrms maximum



PHASE AN VOLTAGE SAG ENDED
PS05 MCC 3A1 Nov 18 1991 11:44 PM

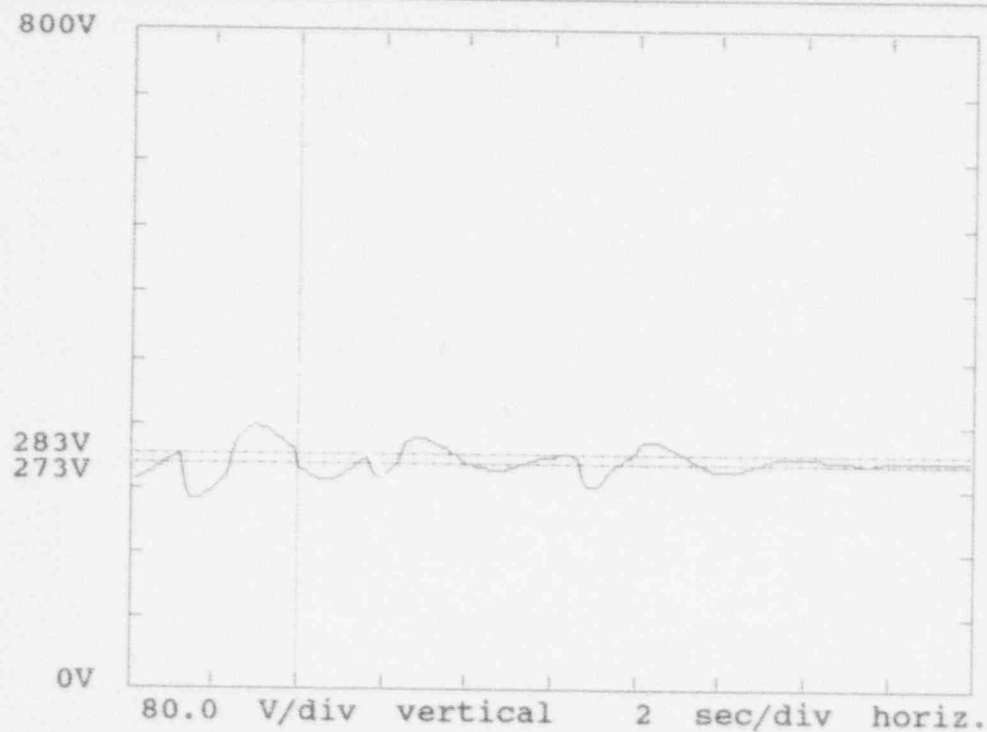
PS05 MCC 3A1

Nov 18 1991

PHASE AN VOLT SURGE END 11:43:25.33PM

319.2 Vrms maximum

227.1 Vrms minimum



PHASE AN VOLTAGE SURGE ENDED

PS05 MCC 3A1

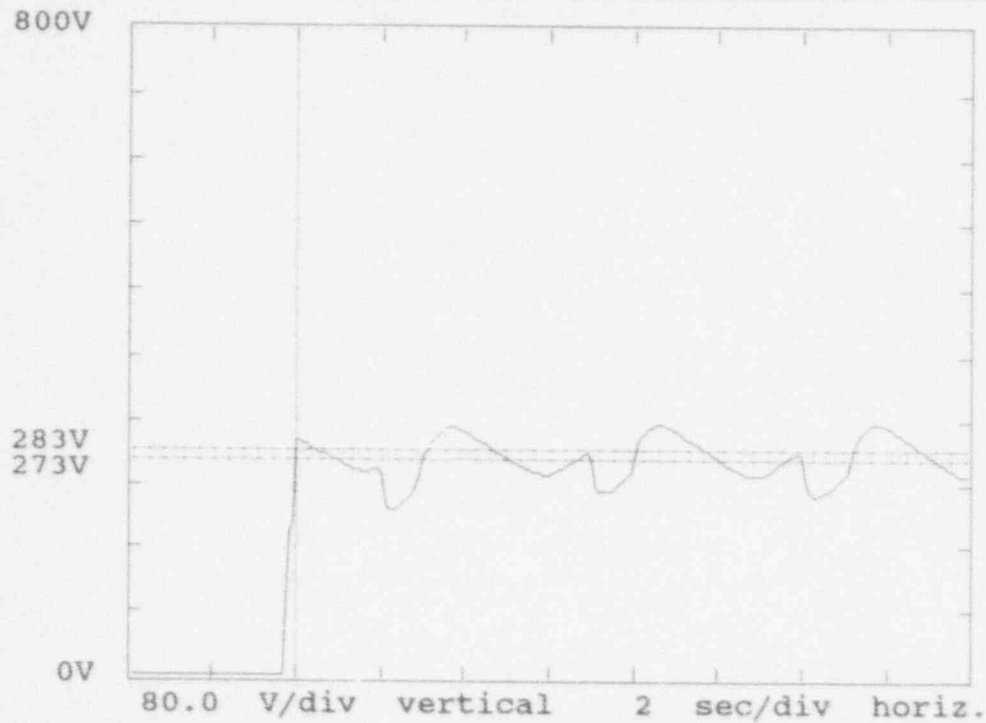
Nov 18 1991 11:45 PM

PS05 MCC 3A1

Nov 18 1991

PHASE BN VOLT. SAG END 11:43:09.89PM

0.0 Vrms minimum
316.5 Vrms maximum



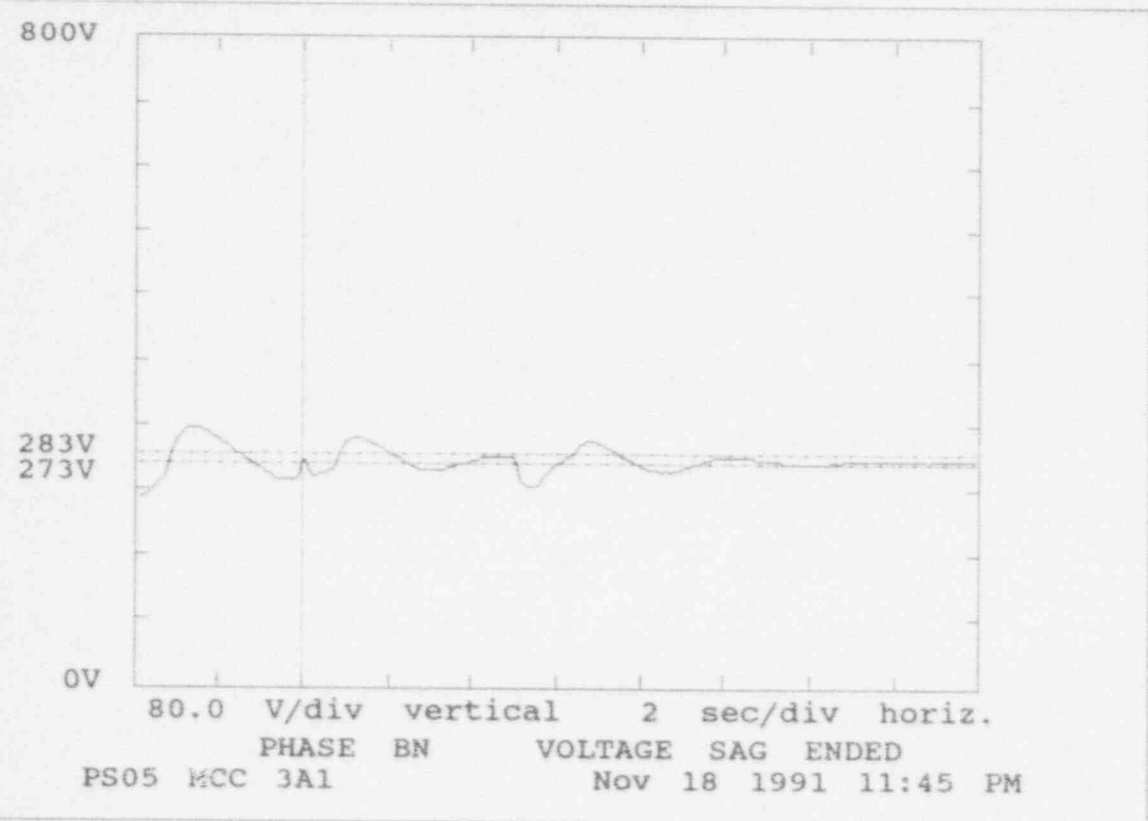
PHASE BN VOLTAGE SAG ENDED
PS05 MCC 3A1 Nov 18 1991 11:44 PM

PS05 MCC 3A1

Nov 18 1991

PHASE BN VOLT. SAG END 11:43:26.90PM

228.6 Vrms minimum
316.5 Vrms maximum

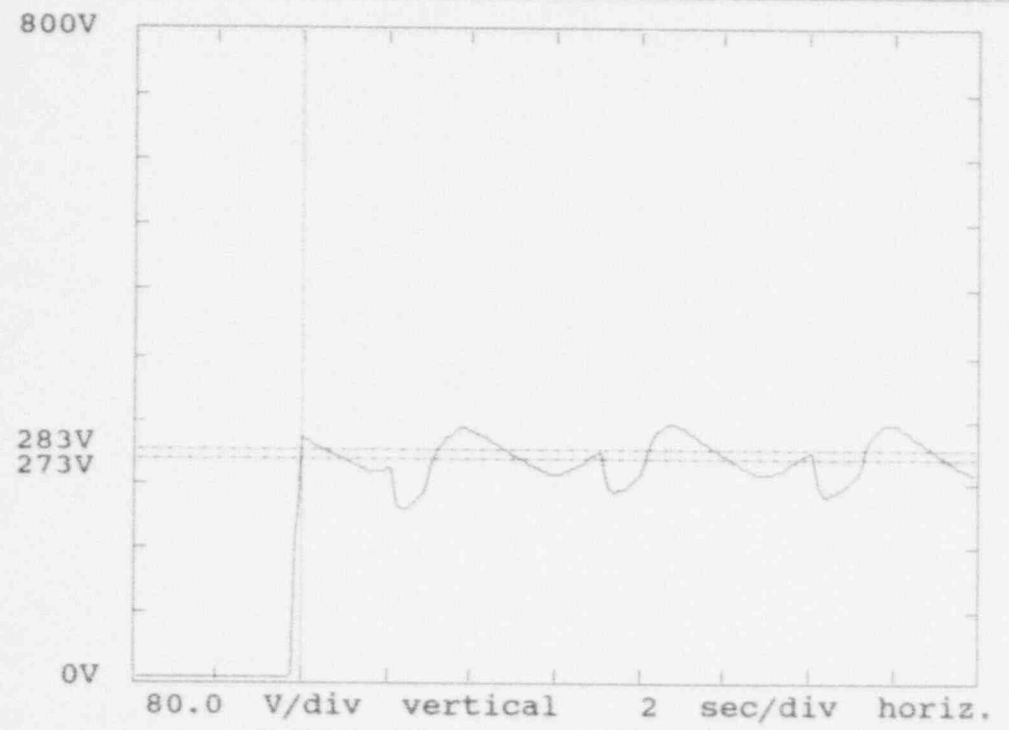


PS05 MCC 3A1

Nov 18 1991

PHASE CN VOLT. SAG END 11:43:09.78PM

0.0 Vrms minimum
316.8 Vrms maximum



PHASE CN VOLTAGE SAG ENDED
PS05 MCC 3A1 Nov 18 1991 11:44 PM

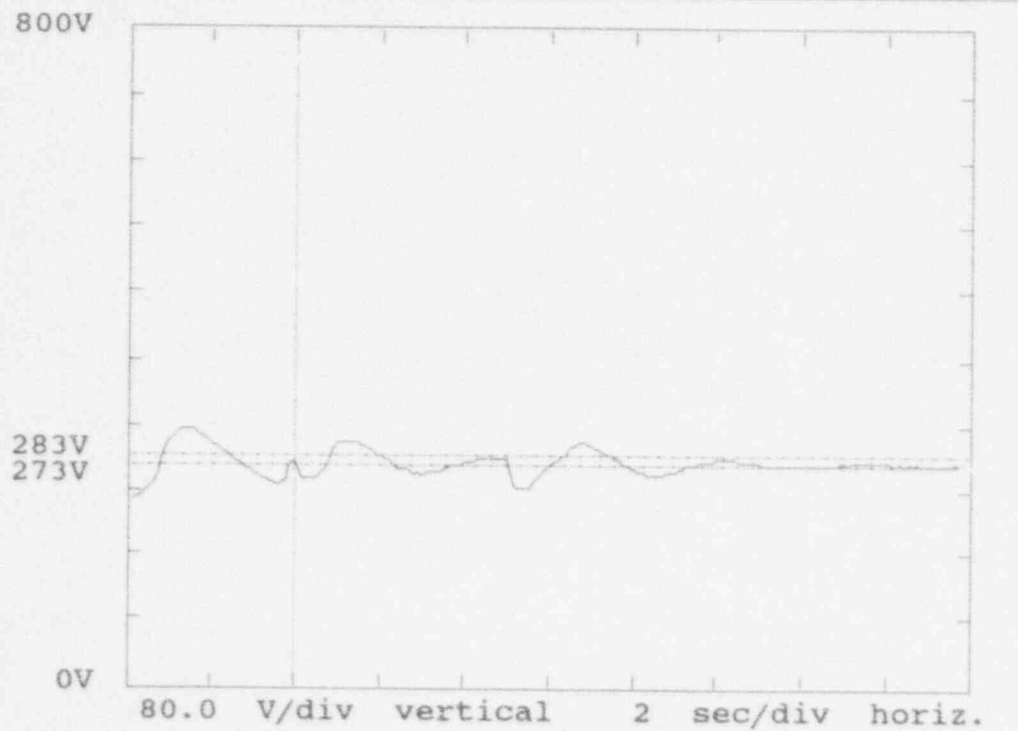
PS05 MCC 3A1

Nov 18 1991

PHASE CN VOLT. SAG END 11:43:26.93PM

228.3 Vrms minimum

316.8 Vrms maximum



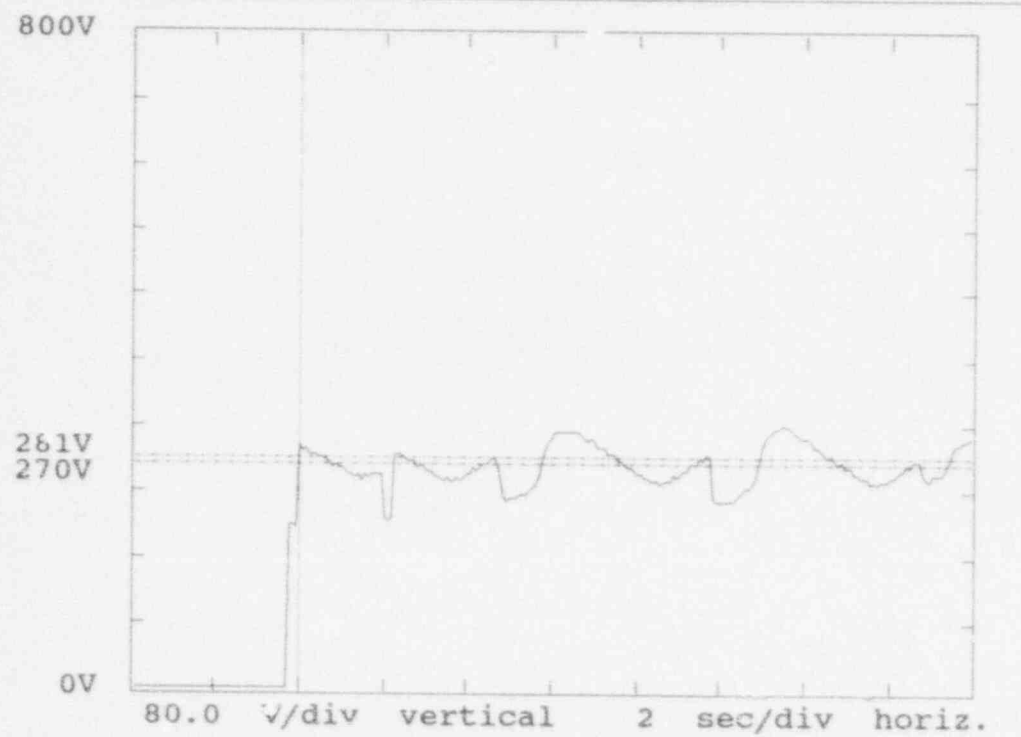
PHASE CN VOLTAGE SAG ENDED
PS05 MCC 3A1 Nov 18 1991 11:45 PM

PS03 MCC 3A2

Nov 18 1991

PHASE AN VOLT. SAG END 11:43:18.70PM

0.0 Vrms minimum
319.7 Vrms maximum



PHASE AN VOLTAGE SAG ENDED
PS03 MCC 3A2 Nov 18 1991 11:45 PM

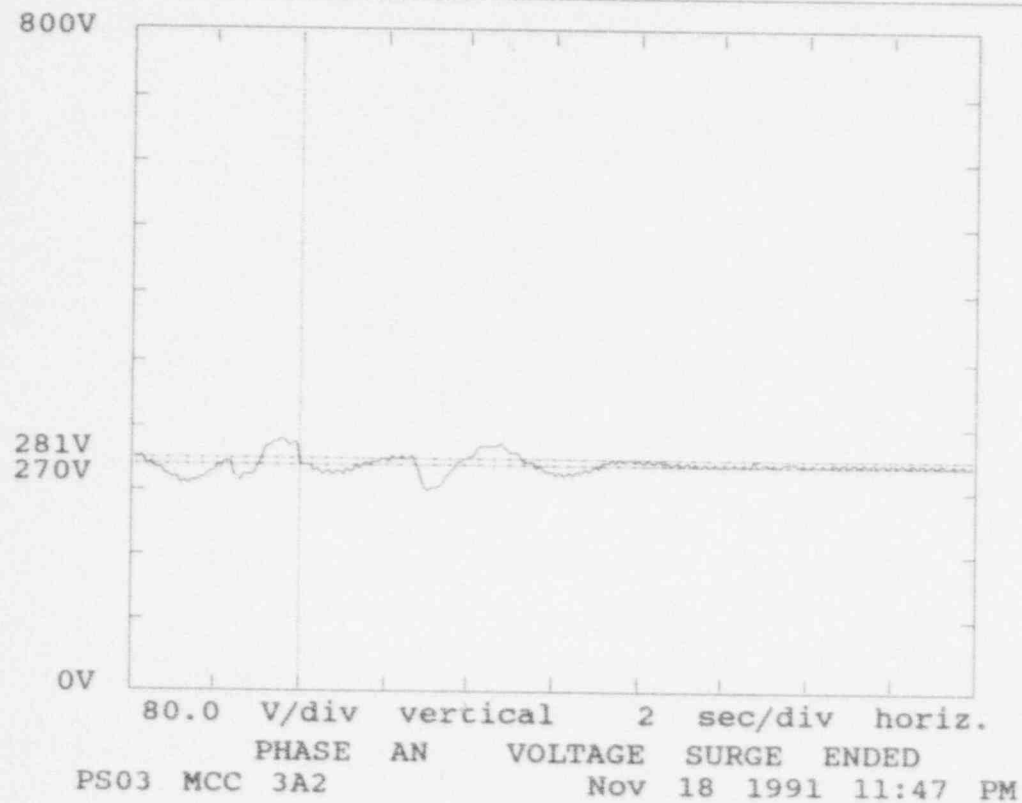
PS03 MCC 3A2

Nov 18 1991

PHASE AN VOLT SURGE END 11:43:37.88PM

304.6 Vrms maximum

241.6 Vrms minimum

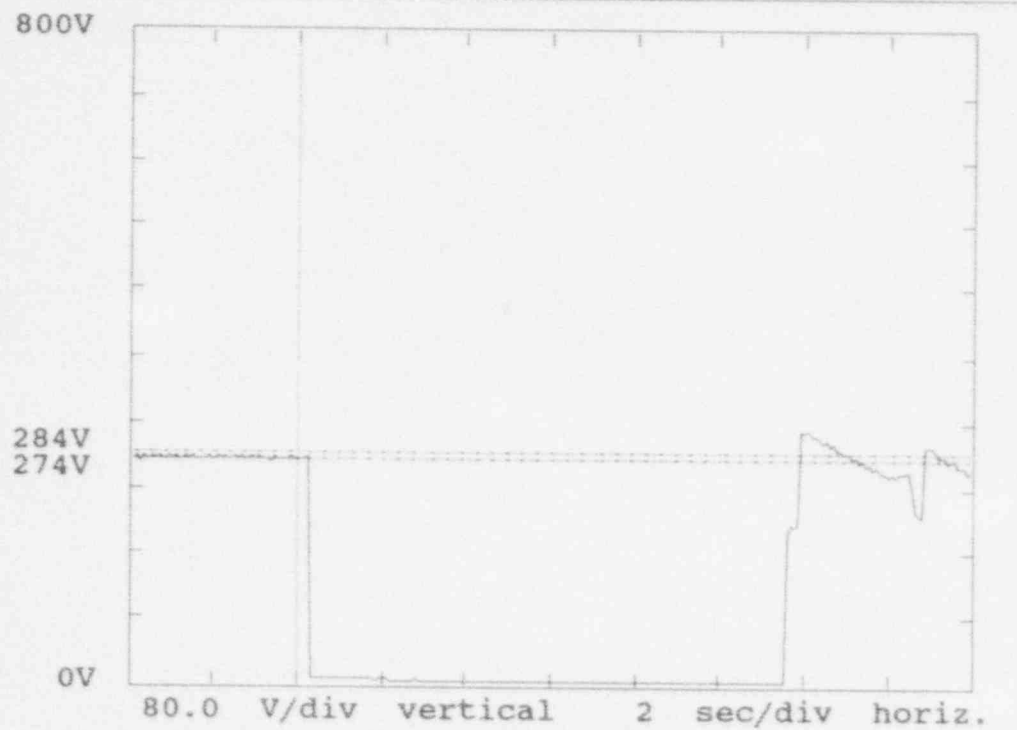


PS03 MCC 3A2

Nov 18 1991

PHASE BN VOLT. SAG END 11:42:47.51PM

0.0 Vrms minimum
312.6 Vrms maximum



PHASE BN VOLTAGE SAG ENDED
PS03 MCC 3A2 Nov 18 1991 11:47 PM

PS03 MCC 3A2

Nov 18 1991

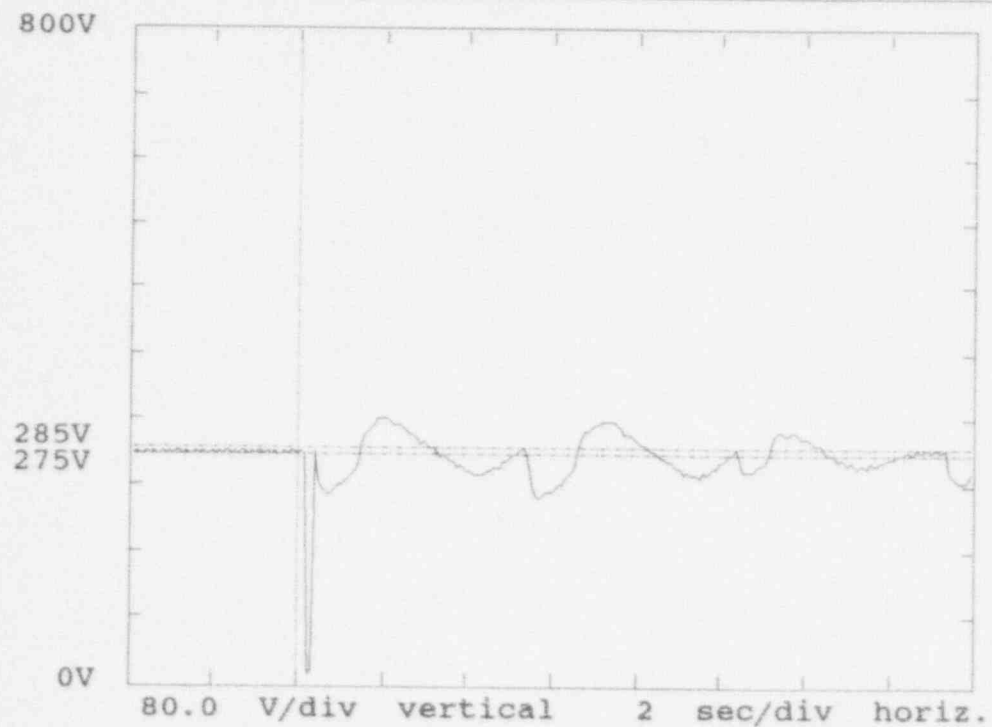
PHASE CN VOLTAGE SAG 11:42:58.42PM

10.2 Vrms minimum

321.4 Vrms maximum

9.0 seconds below threshold

4.5 seconds above threshold



PHASE CN
PS03 MCC 3A2

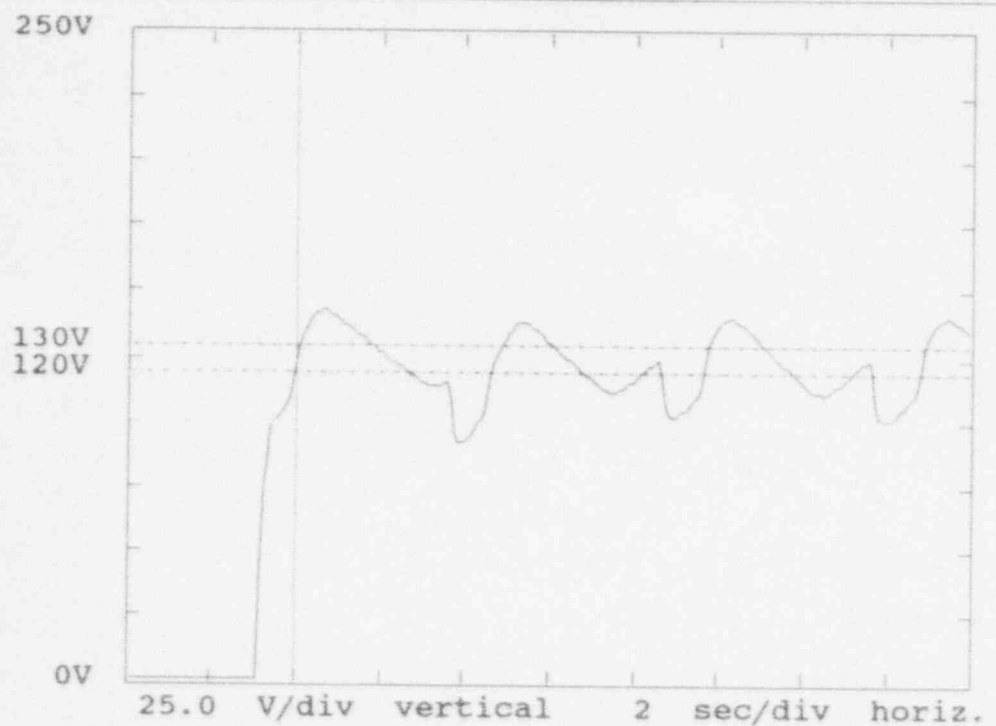
VOLTAGE SAG
Nov 18 1991 11:47 PM

PS03 MCC 3A2

Nov 18 1991

UNIT 7A VOLT. SAG END 11:43:17.00PM

0.0 Vrms minimum
144.1 Vrms maximum



UNIT 7A
PS03 MCC 3A2

VOLTAGE SAG ENDED
Nov 18 1991 11:45 PM

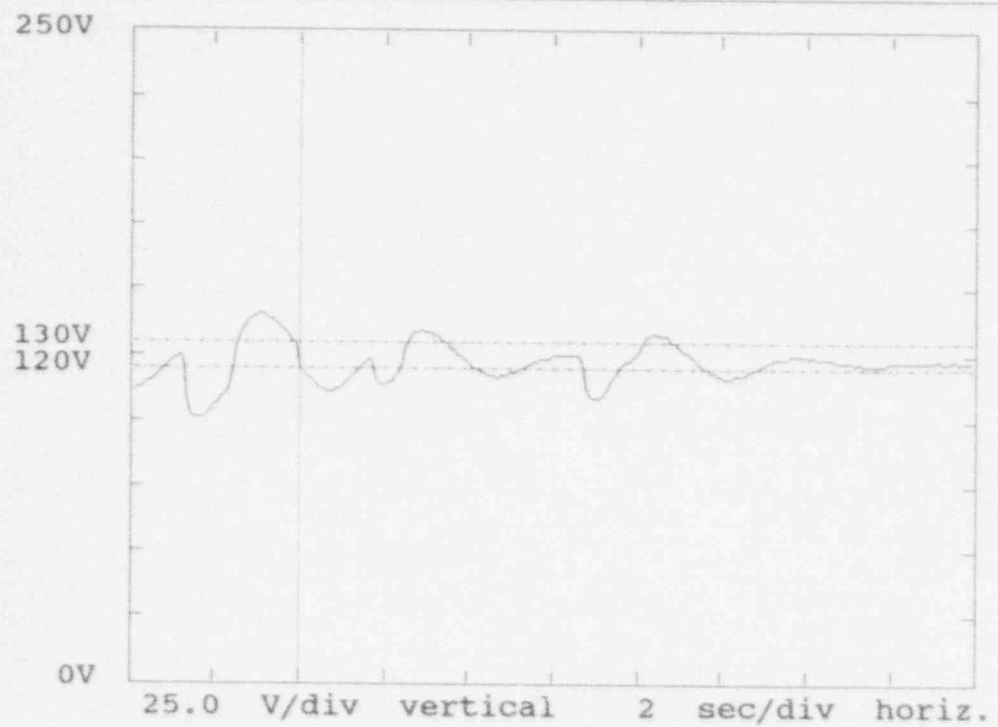
PS03 MCC 3A2

Nov 18 1991

UNIT 7A VOLT SURGE END 11:43:34.00PM

140.7 Vrms maximum

100.8 Vrms minimum



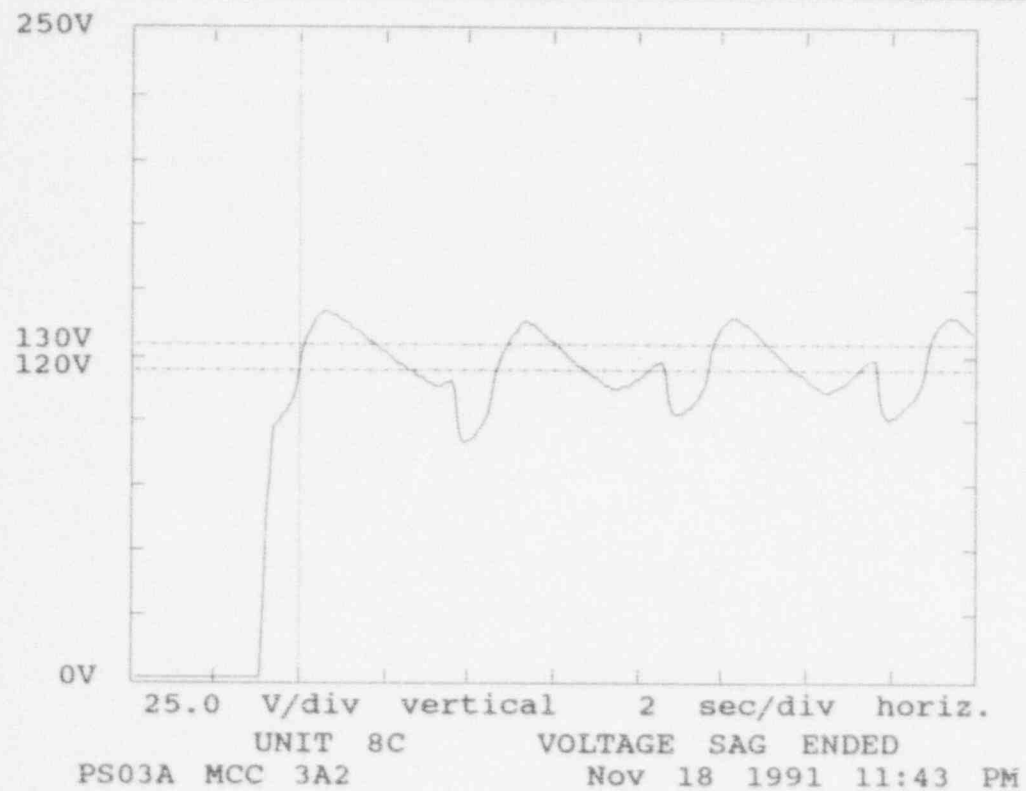
UNIT 7A VOLTAGE SURGE ENDED
PS03 MCC 3A2 Nov 18 1991 11:46 PM

PS03A MCC 3A2

Nov 18 1991

UNIT 8C VOLT. SAG END 11:43:20.79PM

0.0 Vrms minimum
142.8 Vrms maximum



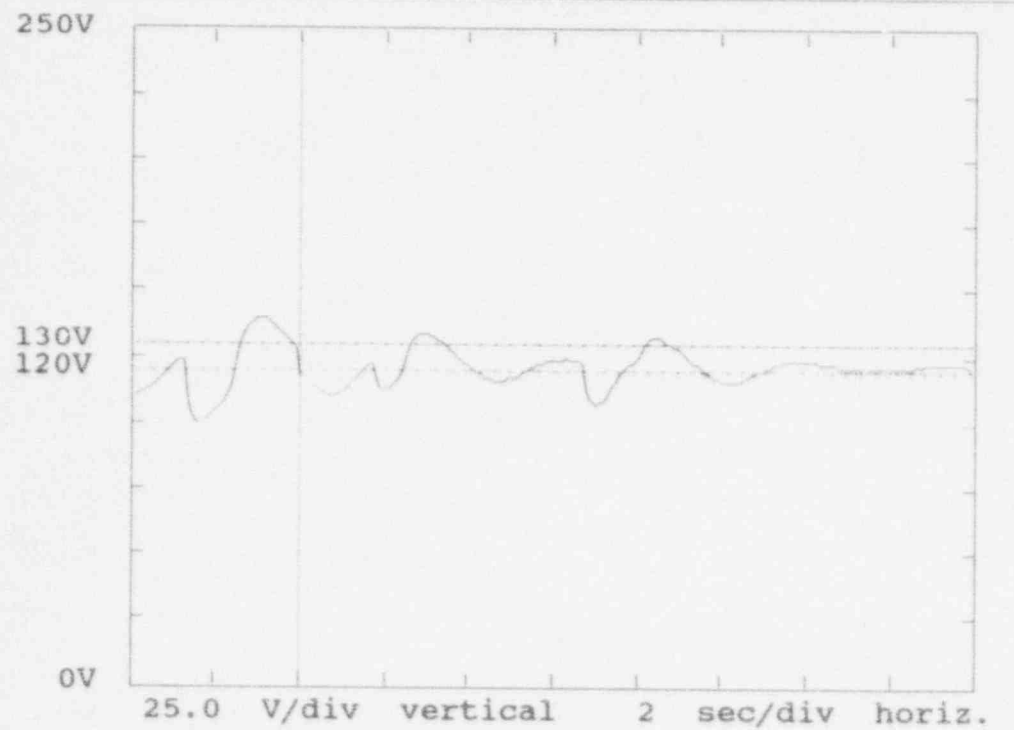
PS03A MCC 3A2

Nov 18 1991

UNIT 8C VOLT SURGE END 11:43:37.80PM

140.2 Vrms maximum

100.4 Vrms minimum



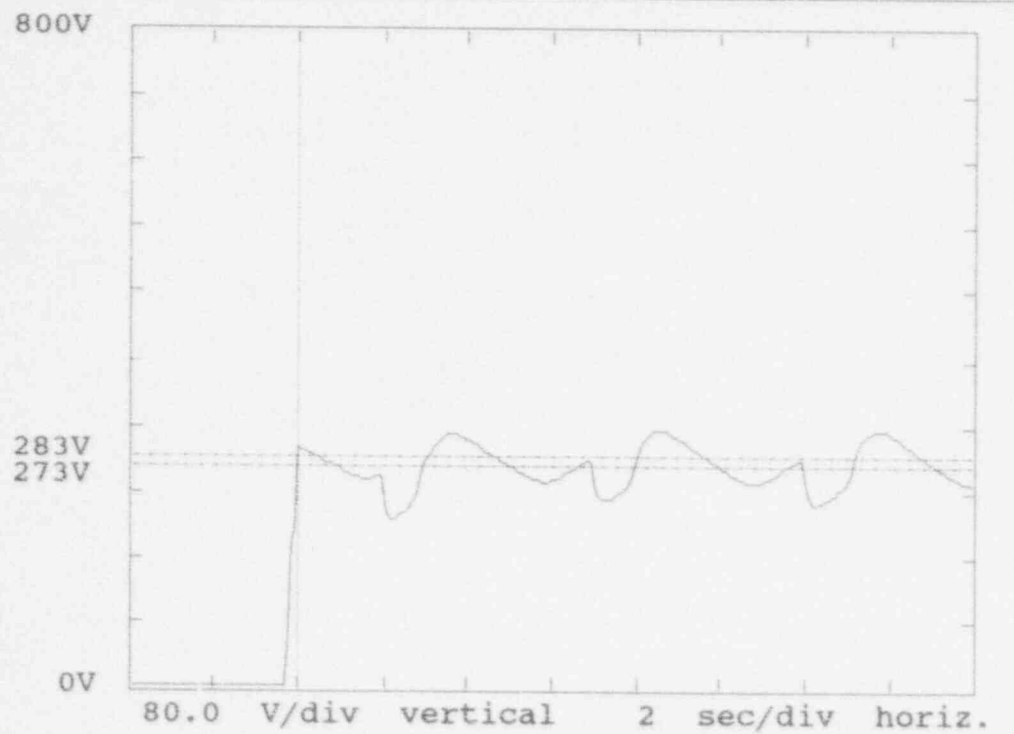
UNIT 8C VOLTAGE SURGE ENDED
PS03A MCC 3A2 Nov 18 1991 11:44 PM

PS04 MCC 3A3

Nov 18 1991

PHASE AN VOLT. SAG END 11:43:25.31PM

0.0 Vrms minimum
317.0 Vrms maximum



PHASE AN VOLTAGE SAG ENDED
PS04 MCC 3A3 Nov 18 1991 11:44 PM

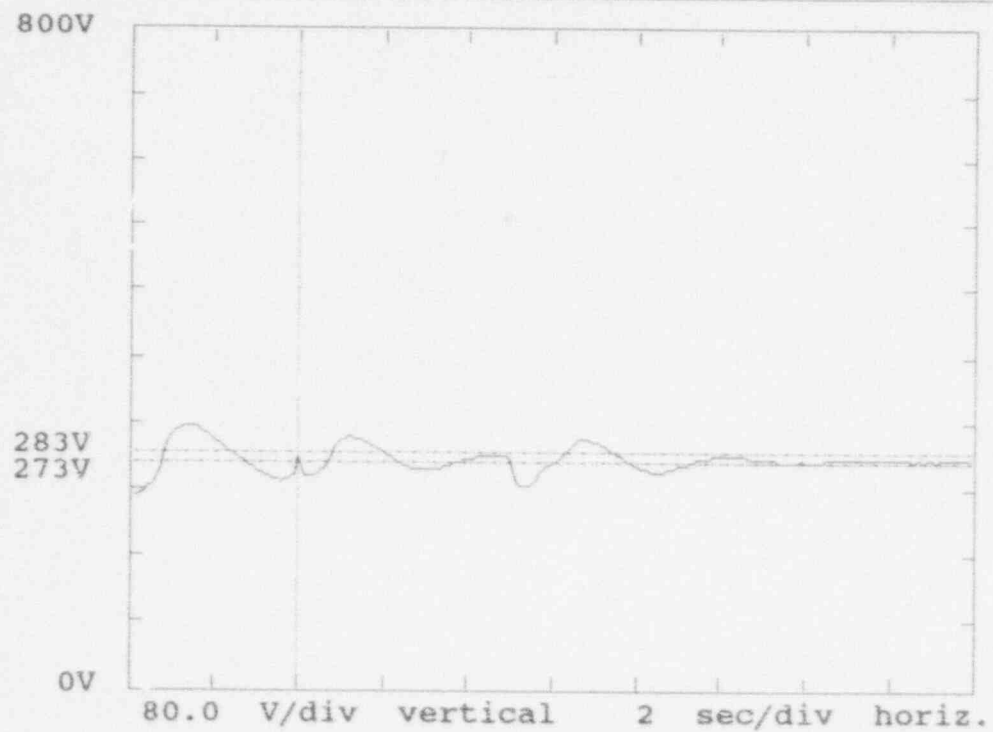
PS04 MCC 3A3

Nov 18 1991

PHASE AN VOLT. SAG END 11:43:42.31PM

230.0 Vrms minimum

317.0 Vrms maximum



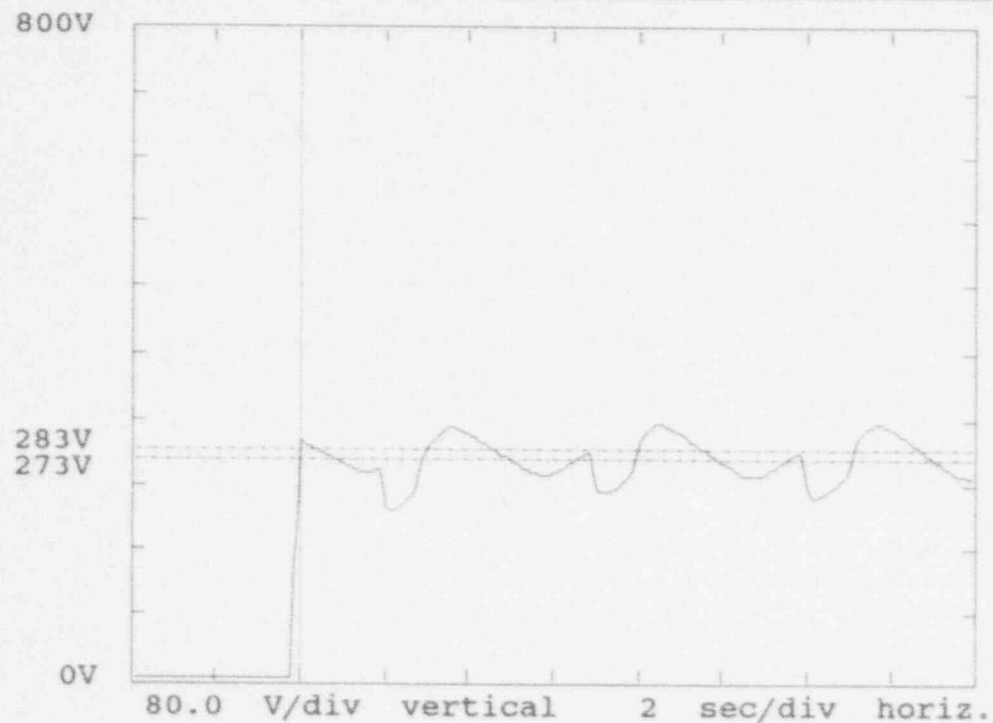
PHASE AN VOLTAGE SAG ENDED
PS04 MCC 3A3 Nov 18 1991 11:45 PM

PS04 MCC 3A3

Nov 18 1991

PHASE BN VOLT. SAG END 11:43:25.35PM

0.0 Vrms minimum
316.5 Vrms maximum



PHASE BN VOLTAGE SAG ENDED

PS04 MCC 3A3

Nov 18 1991 11:45 PM

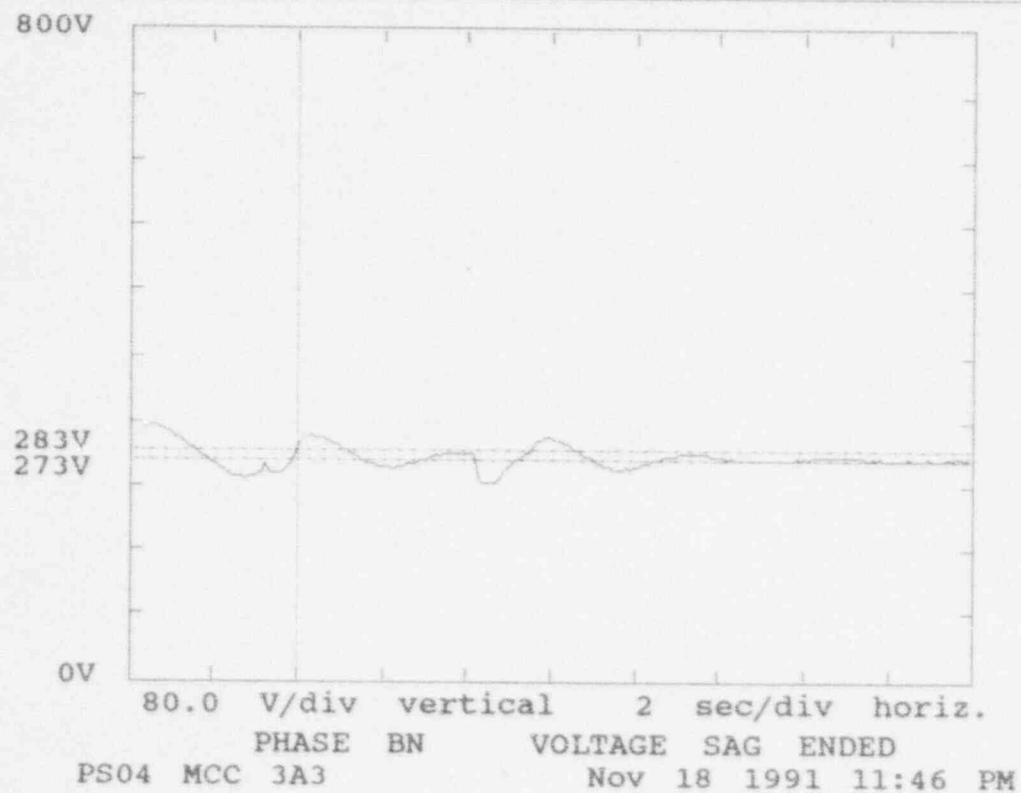
PS04 MCC 3A3

Nov 18 1991

PHASE BN VOLT. SAG END 11:43:43.11PM

242.2 Vrms minimum

316.5 Vrms maximum

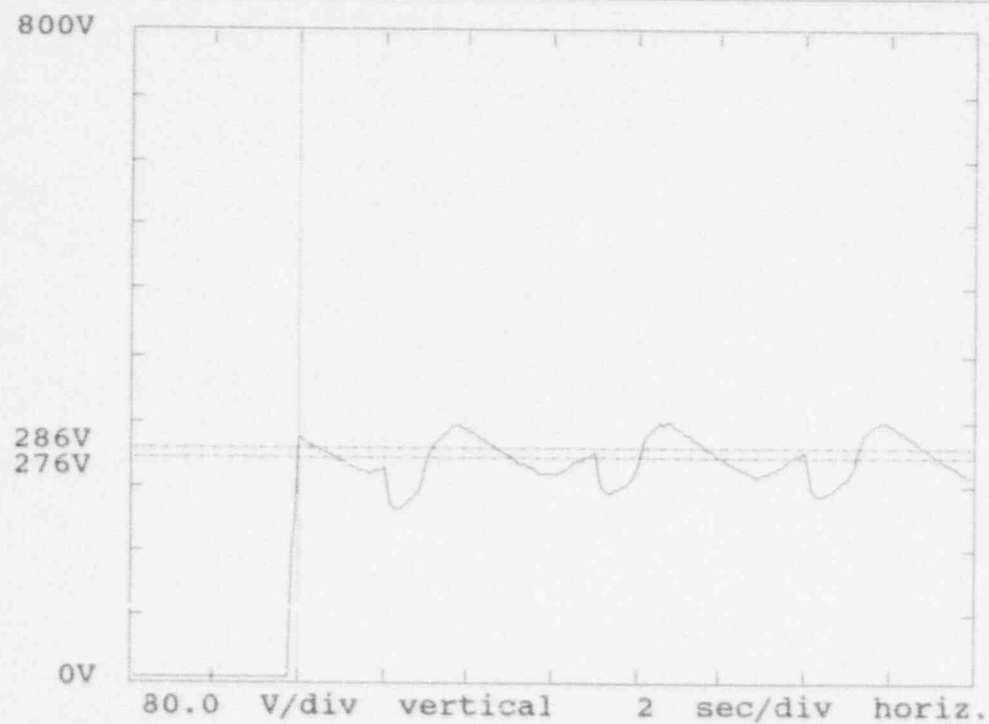


PS04 MCC 3A3

Nov 18 1991

PHASE CN VOLT. SAG END 11:43:25.21PM

0.0 Vrms minimum
320.1 Vrms maximum



PHASE CN VOLTAGE SAG ENDED
PS04 MCC 3A3 Nov 18 1991 11:44 PM

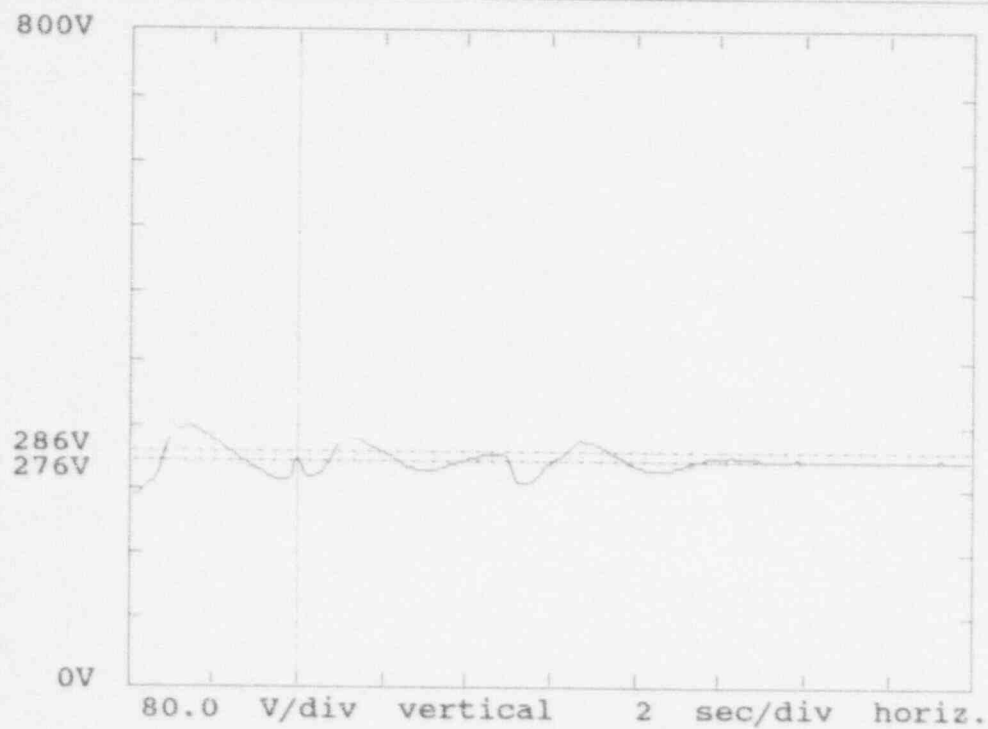
PS04 MCC 3A3

Nov 18 1991

PHASE CN VOLT. SAG END 11:43:42.28PM

230.7 Vrms minimum

320.1 Vrms maximum



PHASE CN VOLTAGE SAG ENDED

PS04 MCC 3A3

Nov 18 1991 11:45 PM

PS13 EGDG 1B OUTPUT

Nov 18 1991

AN BUS PT VOLTAGE SAG

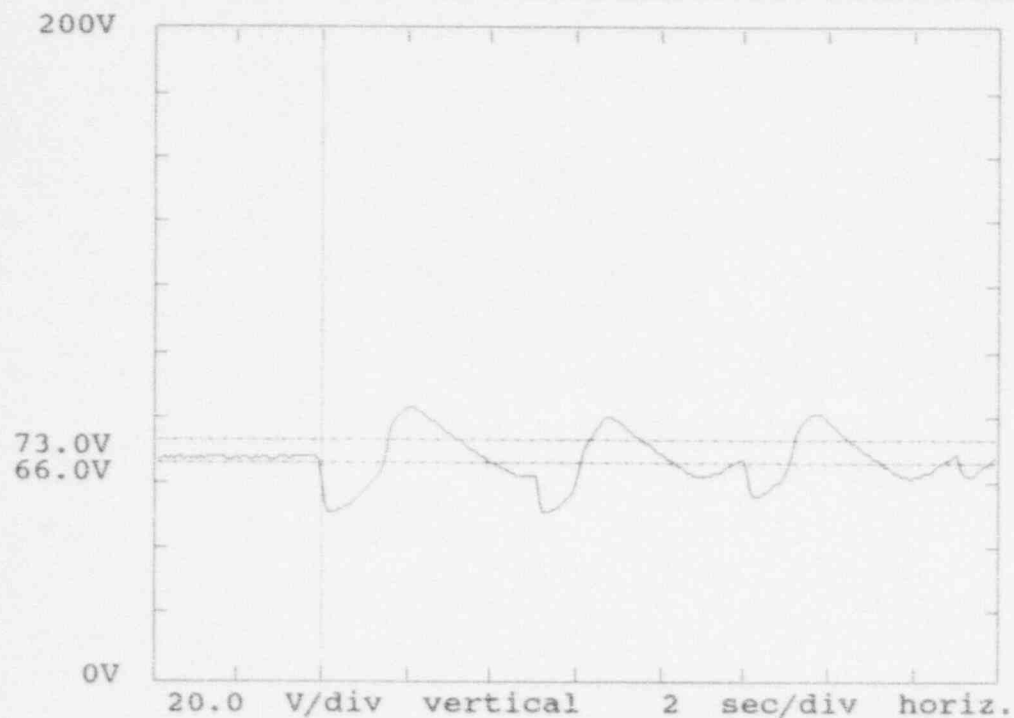
12:44:19.31PM

51.0 Vrms minimum

83.4 Vrms maximum

8.0 seconds below threshold

4.2 seconds above threshold



AN BUS PT VOLTAGE SAG
PS13 EGDG 1B OUTPUT Nov 18 1991 12:45 PM

PS13 EGDG 1B OUTPUT

Nov 18 1991

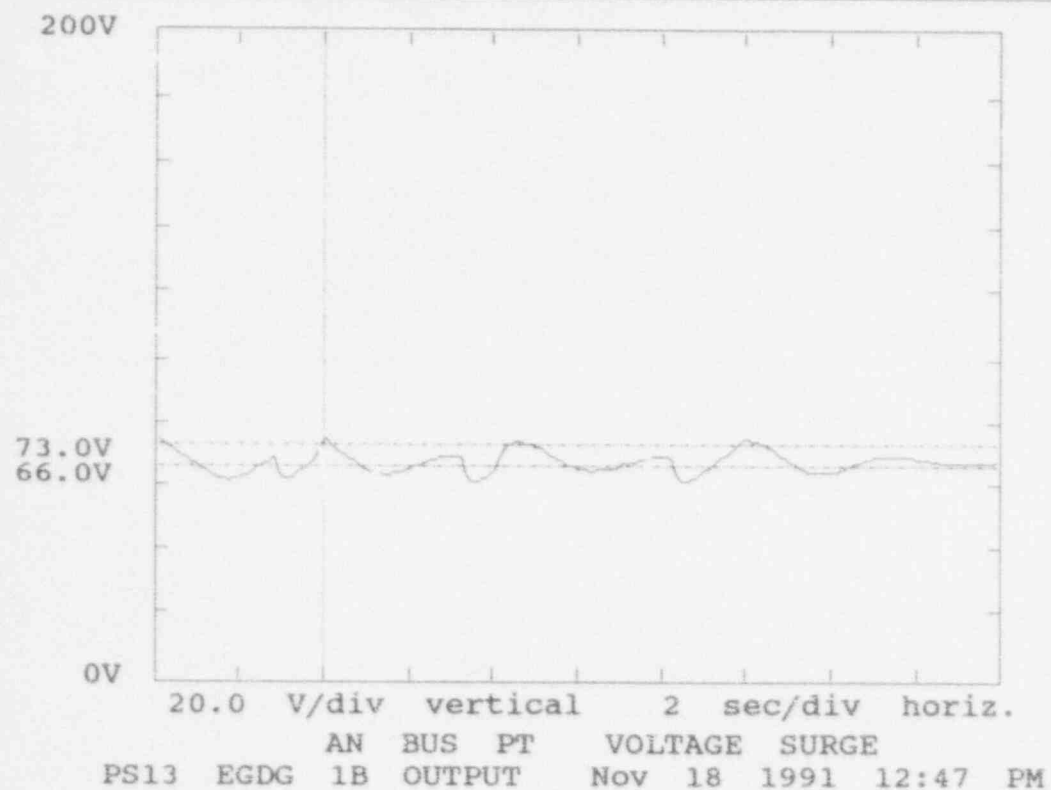
AN BUS PT VOLTAGE SURGE 12:44:35.60PM

75.4 Vrms maximum

61.1 Vrms minimum

7.3 seconds below threshold

1.5 seconds above threshold



PS13 EGDG 1B OUTPUT

Nov 18 1991

BN BUS PT VOLTAGE SAG

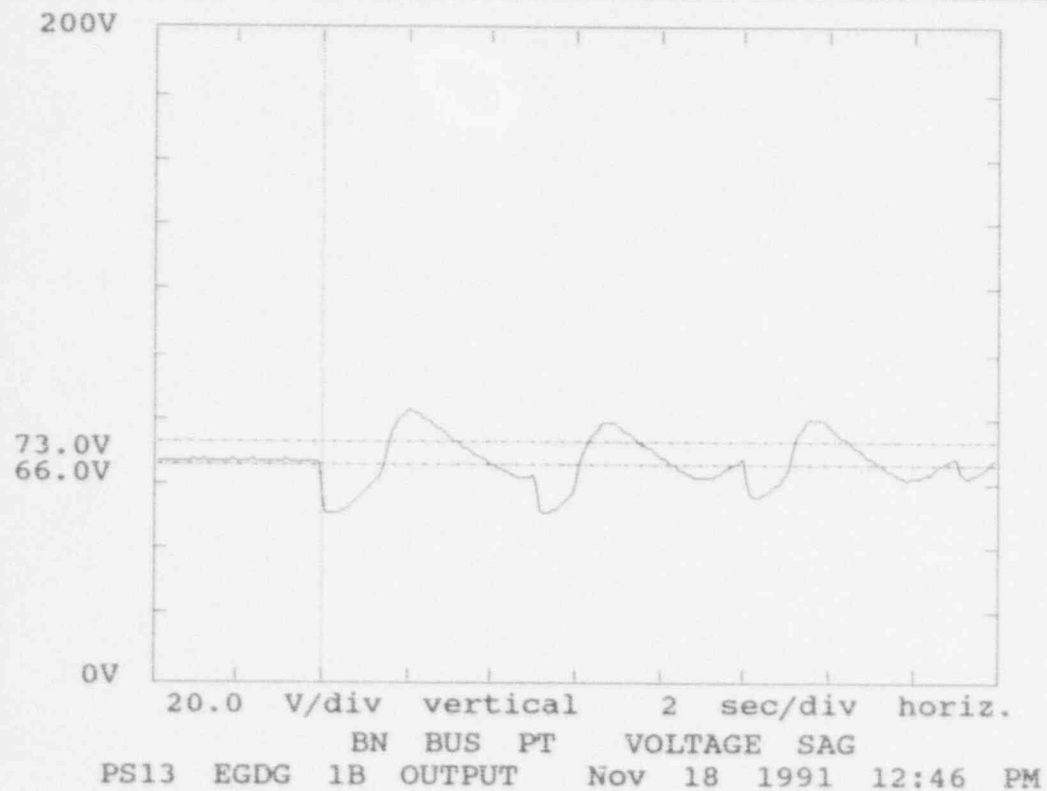
12:44:19.34PM

50.5 Vrms minimum

82.9 Vrms maximum

8.3 seconds below threshold

4.1 seconds above threshold



PS13 EGDG 1B OUTPUT

Nov 18 1991

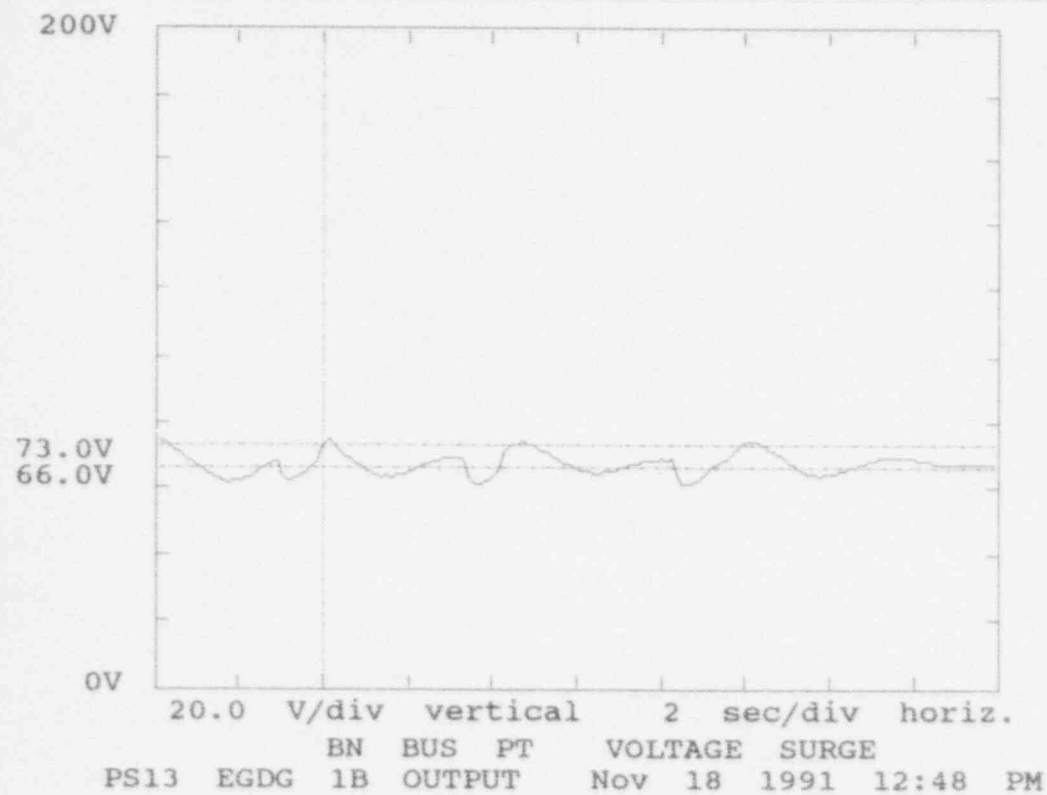
BN BUS PT VOLTAGE SURGE 12:44:35.54PM

75.2 Vrms maximum

60.8 Vrms minimum

7.6 seconds below threshold

1.4 seconds above threshold



PS13 EGDG 1B OUTPUT

Nov 18 1991

CN BUS PT VOLTAGE SAG

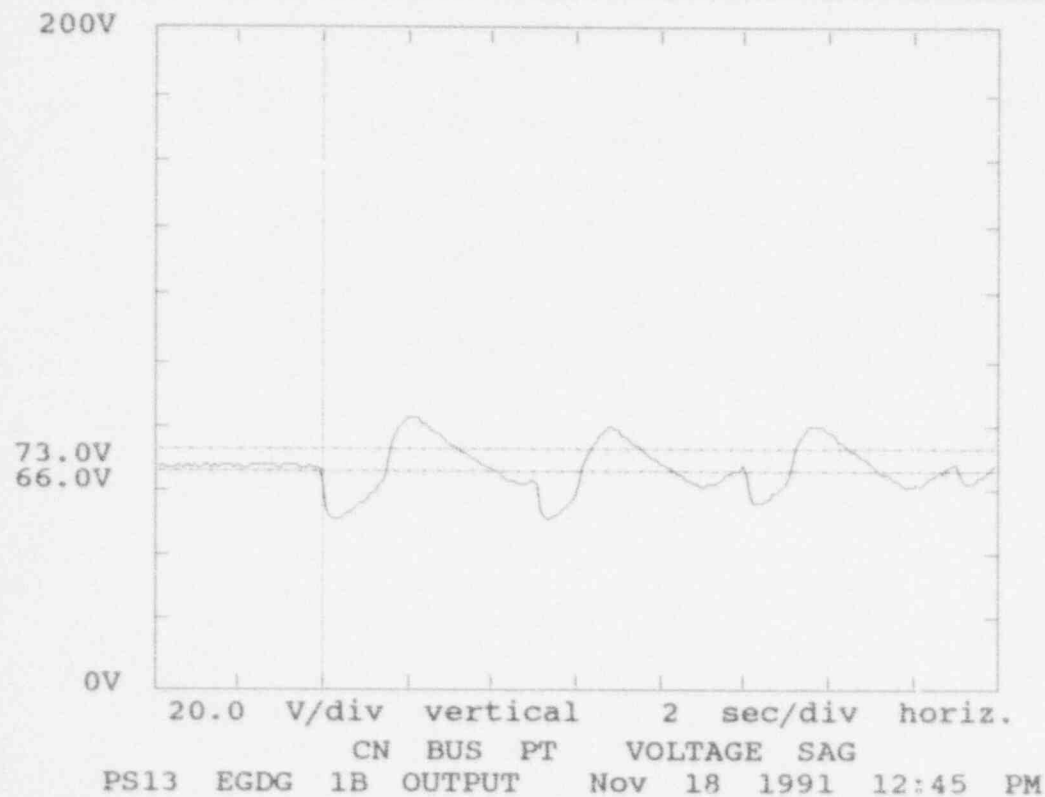
12:44:19.30PM

50.6 Vrms minimum

83.3 Vrms maximum

8.5 seconds below threshold

4.1 seconds above threshold



PS13 EGDG 1B OUTPUT

Nov 18 1991

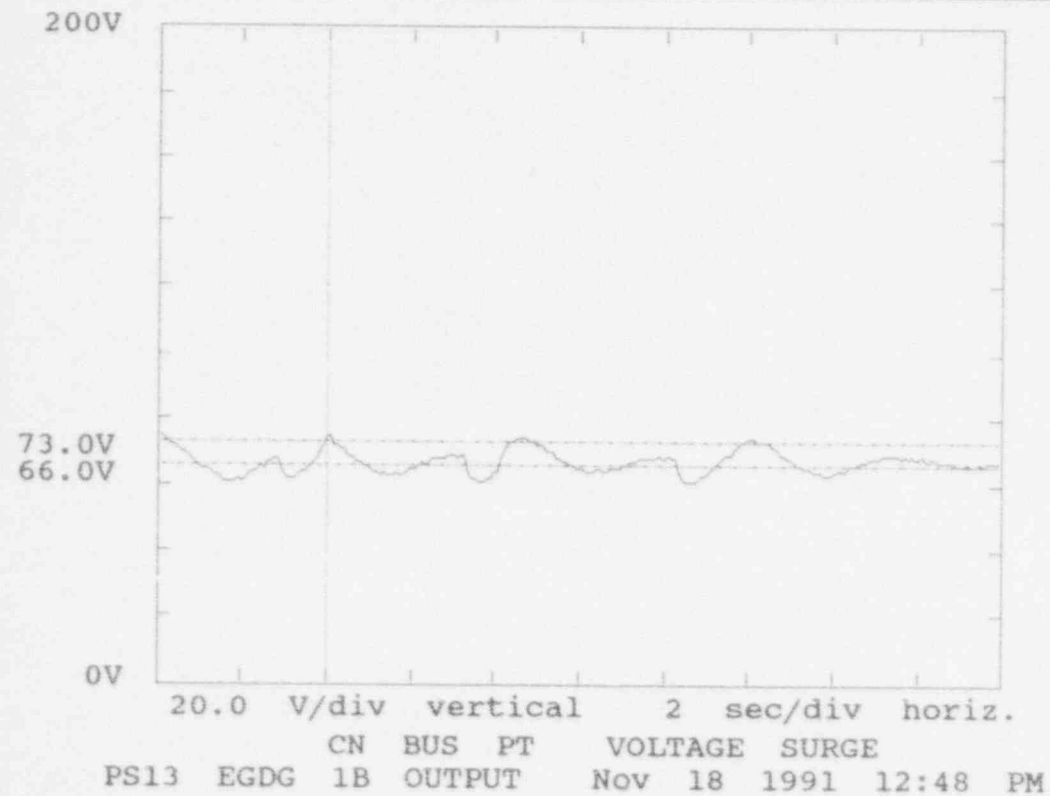
CN BUS PT VOLTAGE SURGE 12:44:35.58PM

74.7 Vrms maximum

60.6 Vrms minimum

7.7 seconds below threshold

1.3 seconds above threshold



PS07 4160V BUS 3B

Nov 18 1991

PHASE AN VOLTAGE SAG

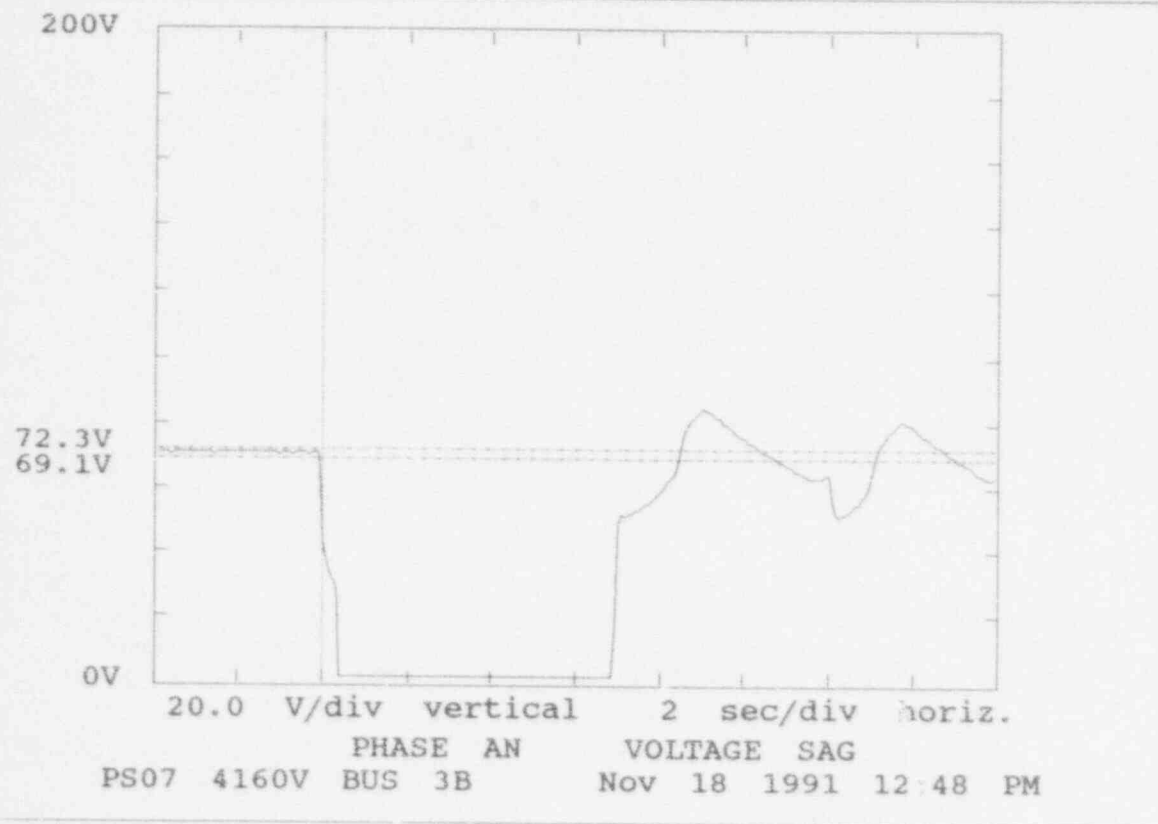
12:44:05.92PM

0.0 Vrms minimum

84.7 Vrms maximum

11.8 seconds below threshold

3.4 seconds above threshold

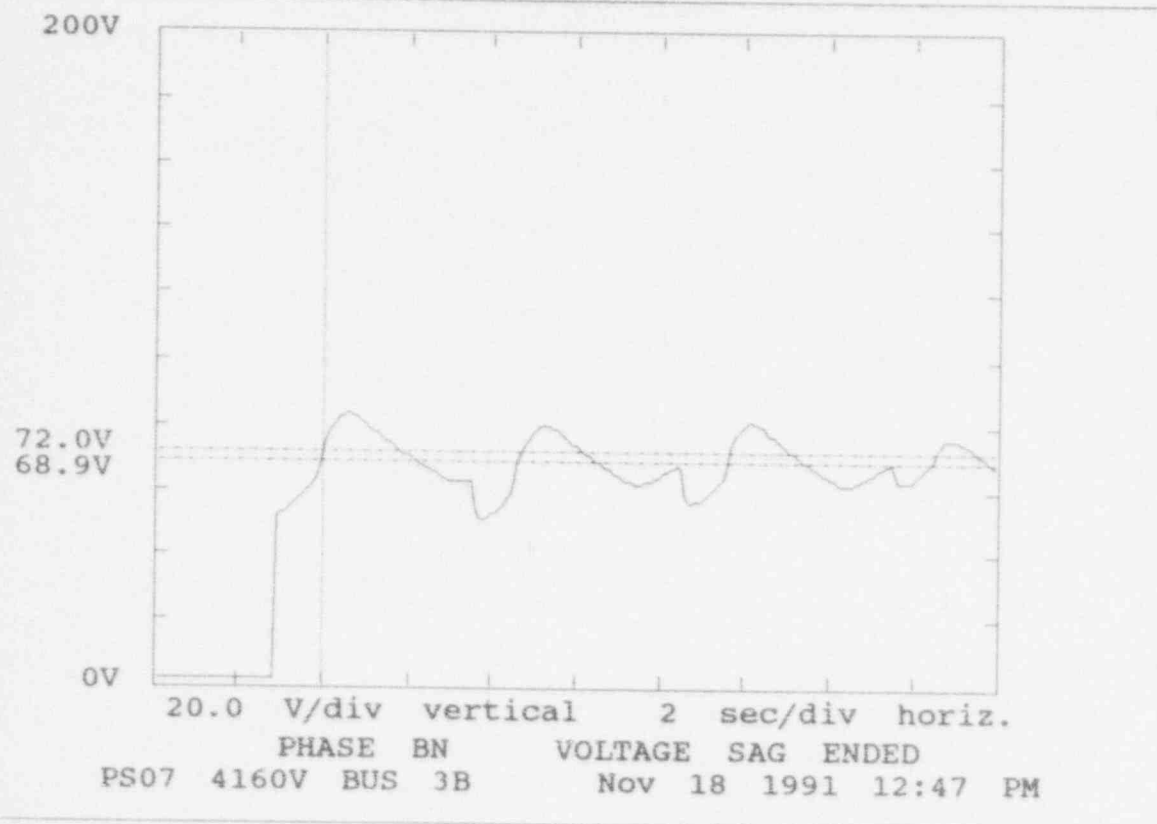


PS07 4160V BUS 3B

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:23.84PM

0.0 Vrms minimum
83.9 Vrms maximum



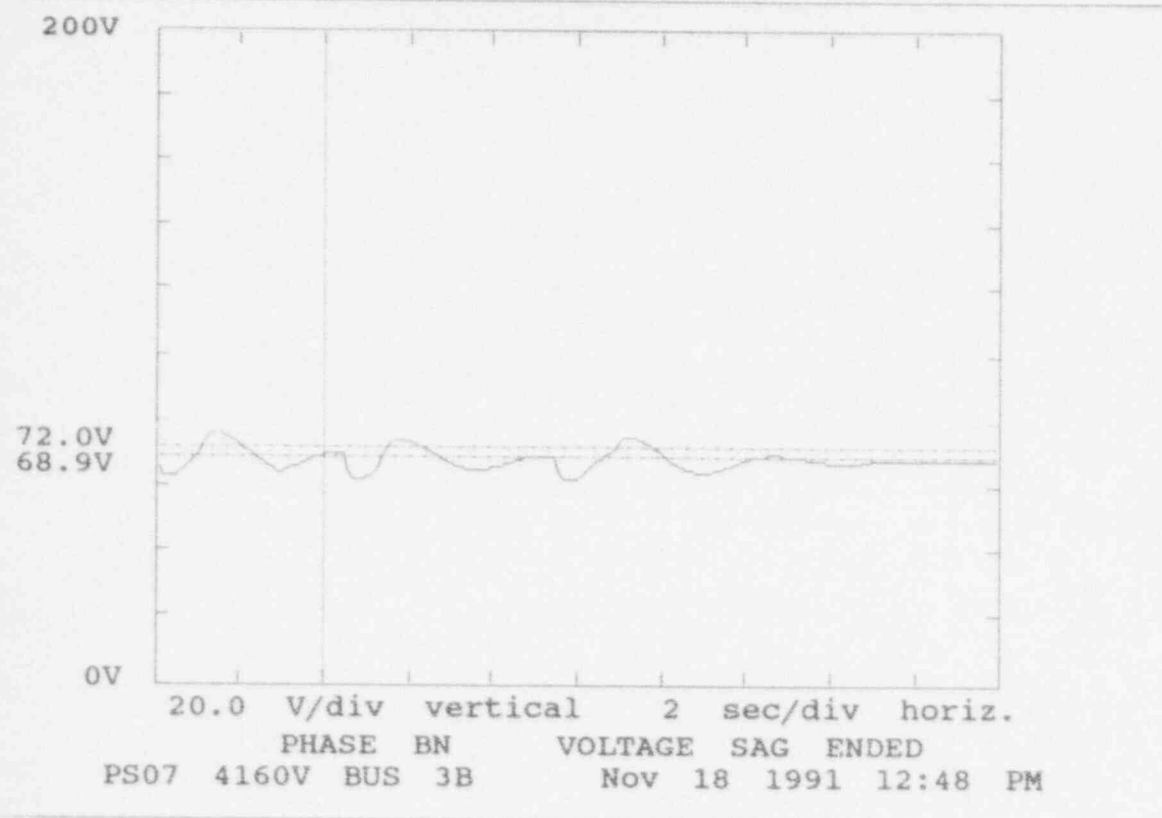
PS07 4160V BUS 3B

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:41.95PM

61.6 Vrms minimum

76.4 Vrms maximum

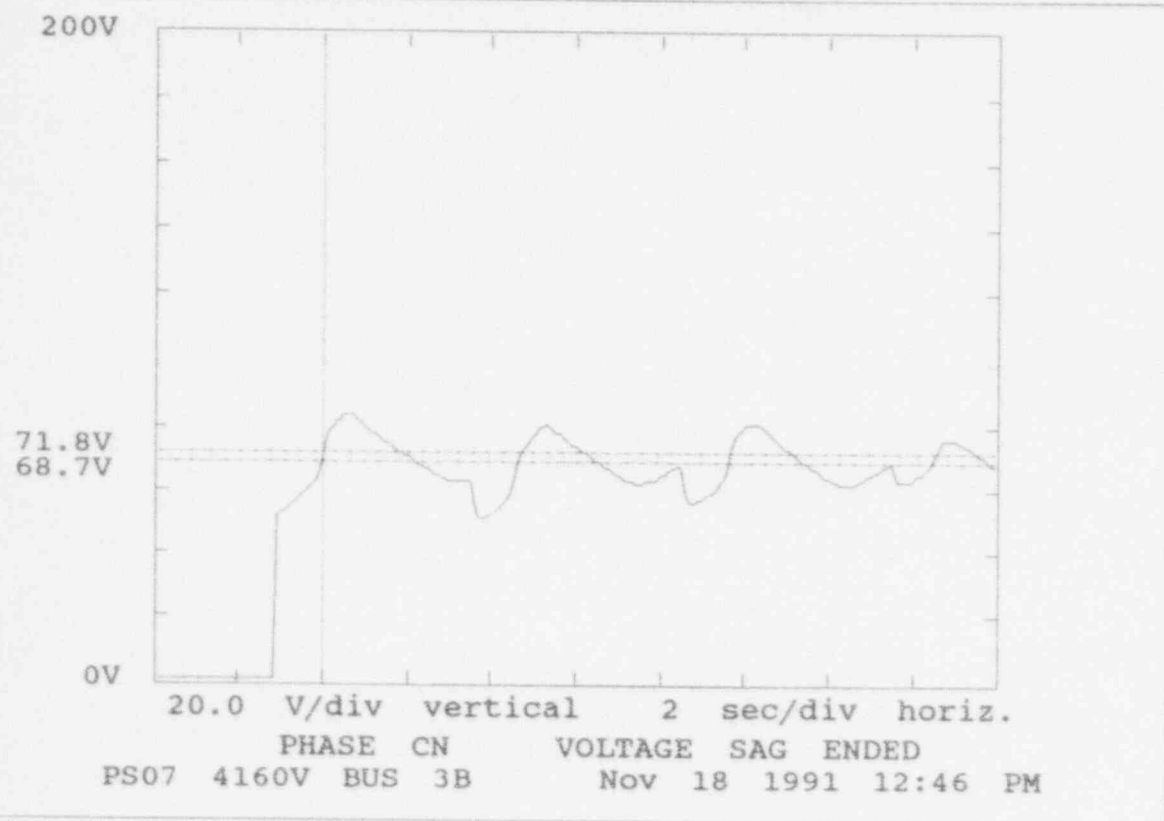


PS07 4160V BUS 3B

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:23.84PM

0.0 Vrms minimum
84.0 Vrms maximum



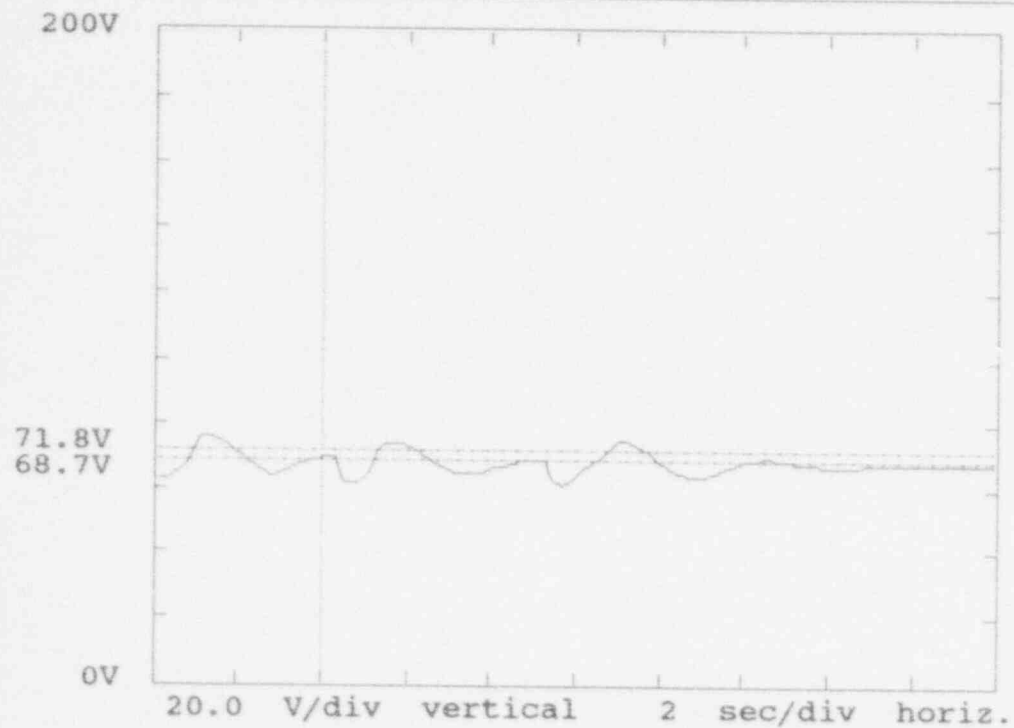
PS07 4160V BUS 3B

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:42.09PM

61.5 Vrms minimum

76.5 Vrms maximum



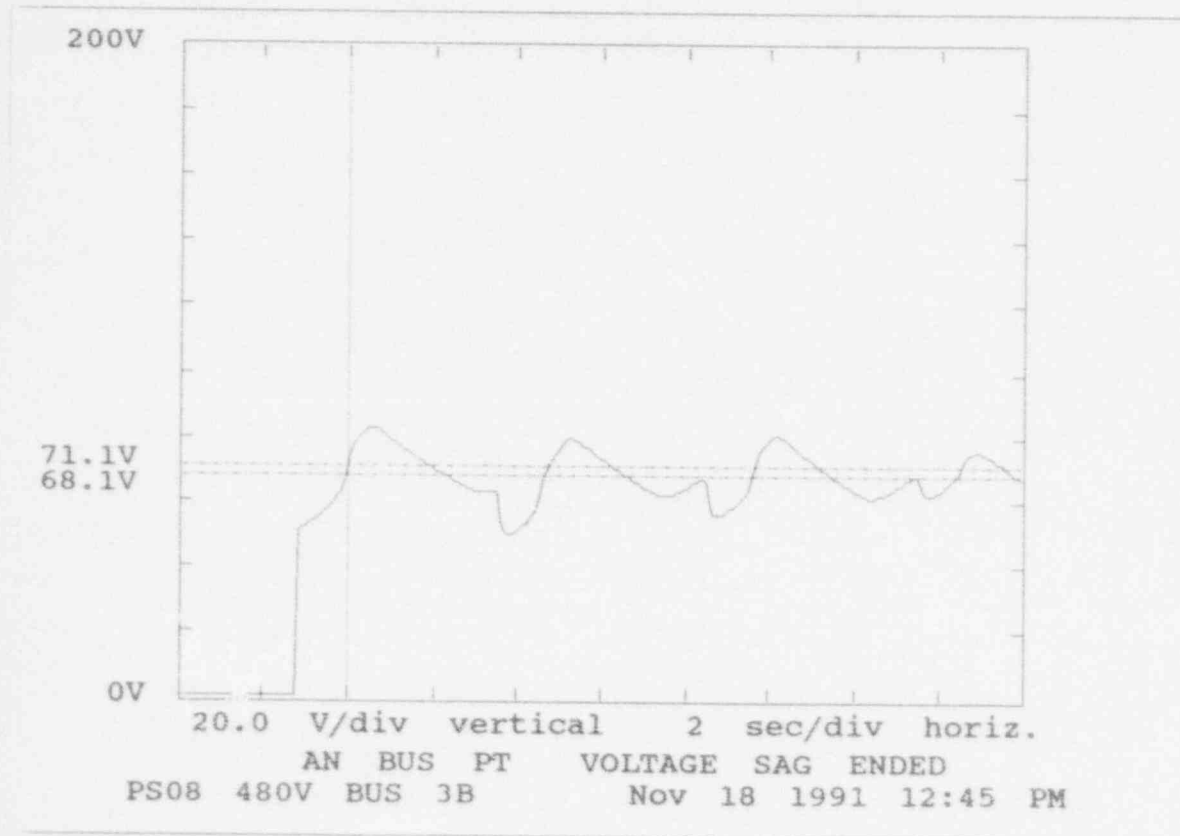
PHASE CN VOLTAGE SAG ENDED
PS07 4160V BUS 3B Nov 18 1991 12:47 PM

PS08 480V BUS 3B

Nov 18 1991

AN BUS PT VOLT. SAG END 12:44:10.88PM

0.0 Vrms minimum
83.1 Vrms maximum



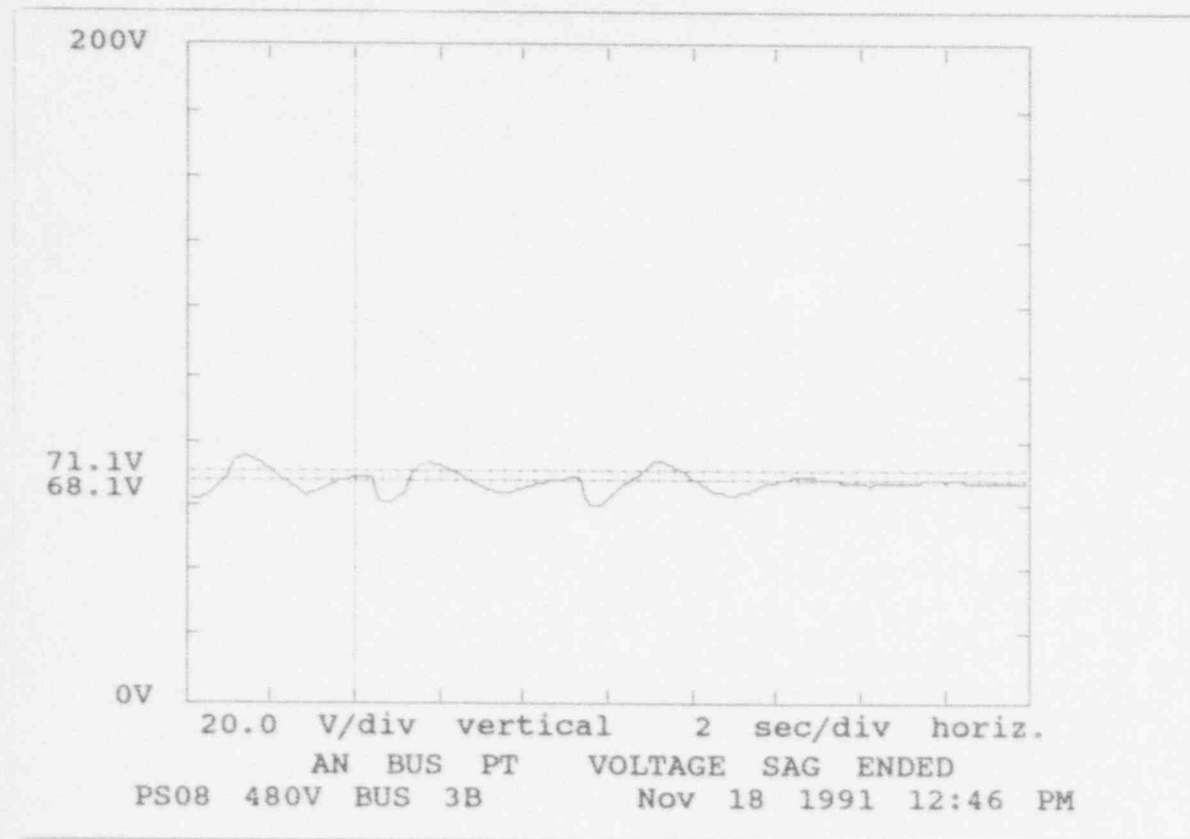
PS08 480V BUS 3B

Nov 18 1991

AN BUS PT VOLT. SAG END 12:44:29.06PM

59.7 Vrms minimum

75.7 Vrms maximum

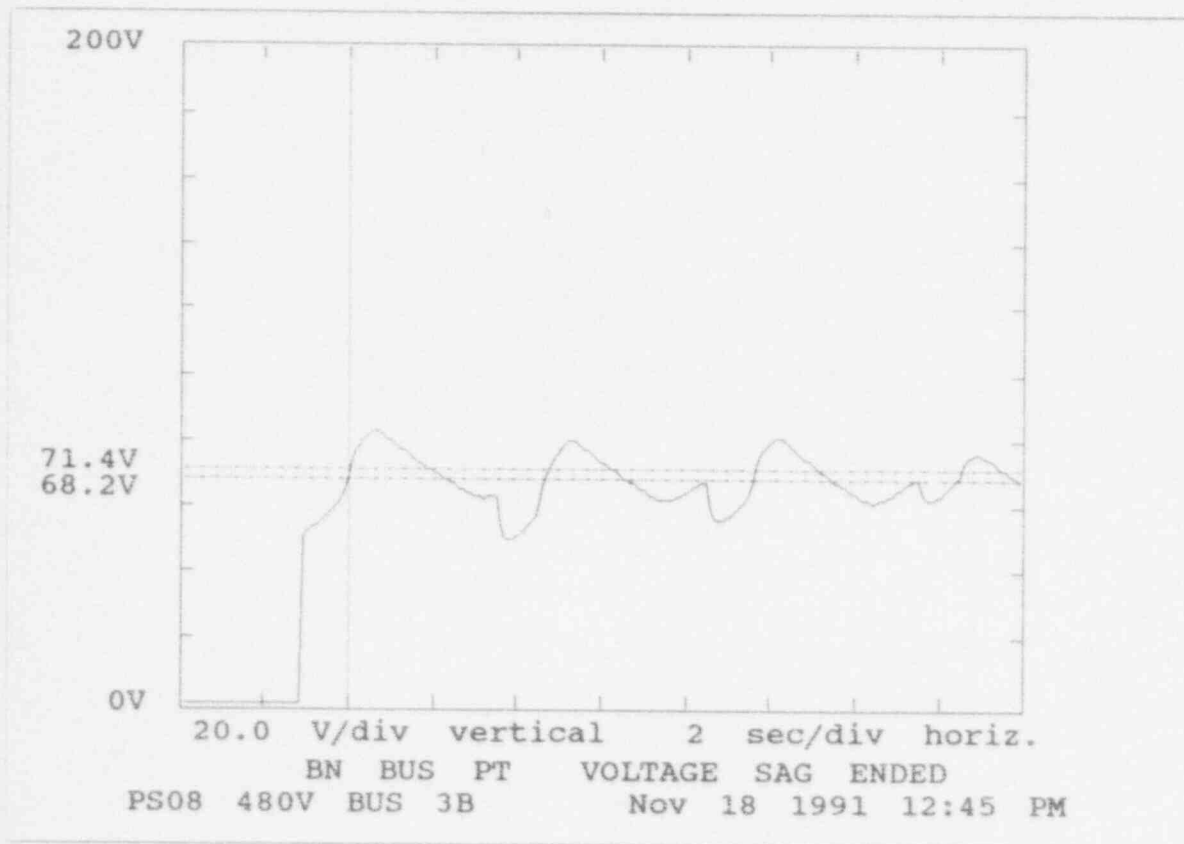


PS08 480V BUS 3B

Nov 18 1991

BN BUS PT VOLT. SAG END 12:44:10.87PM

0.0 Vrms minimum
82.7 Vrms maximum



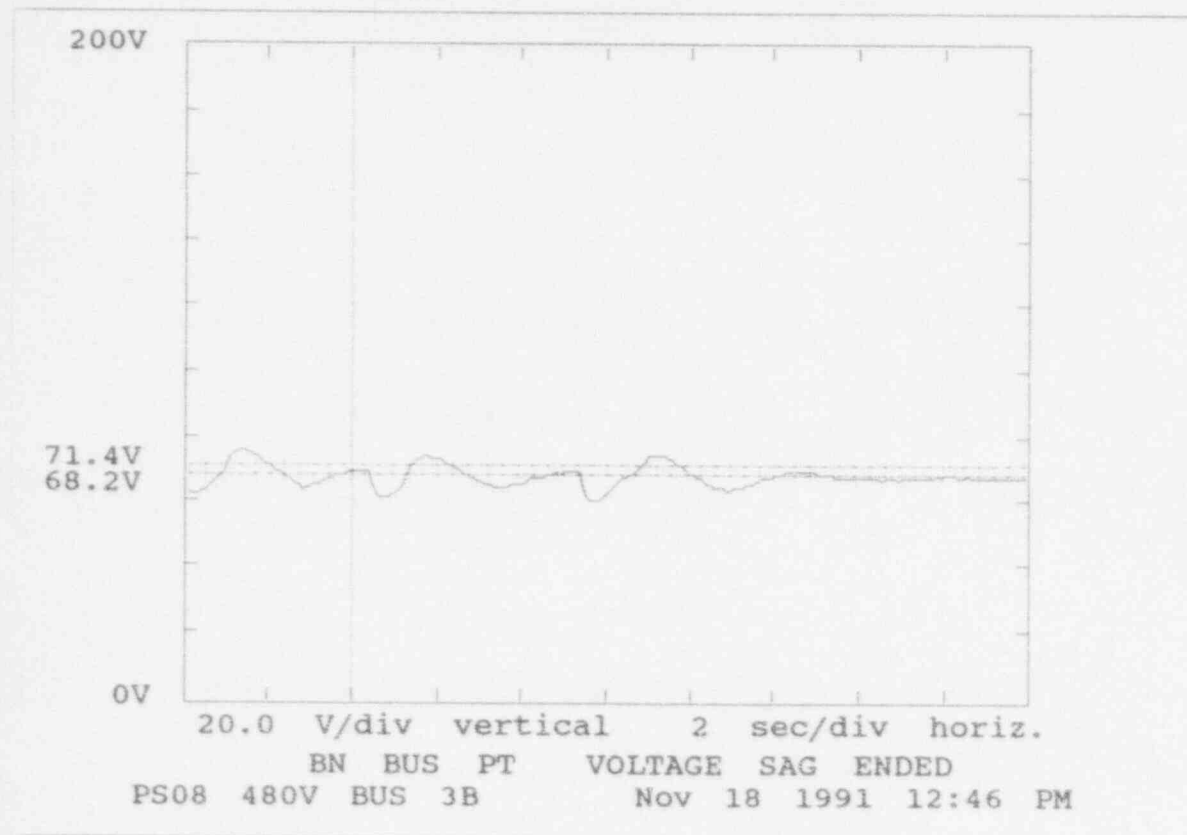
PS08 480V BUS 3B

Nov 18 1991

BN BUS PT VOLT. SAG END 12:44:29.03PM

59.8 Vrms minimum

75.8 Vrms maximum

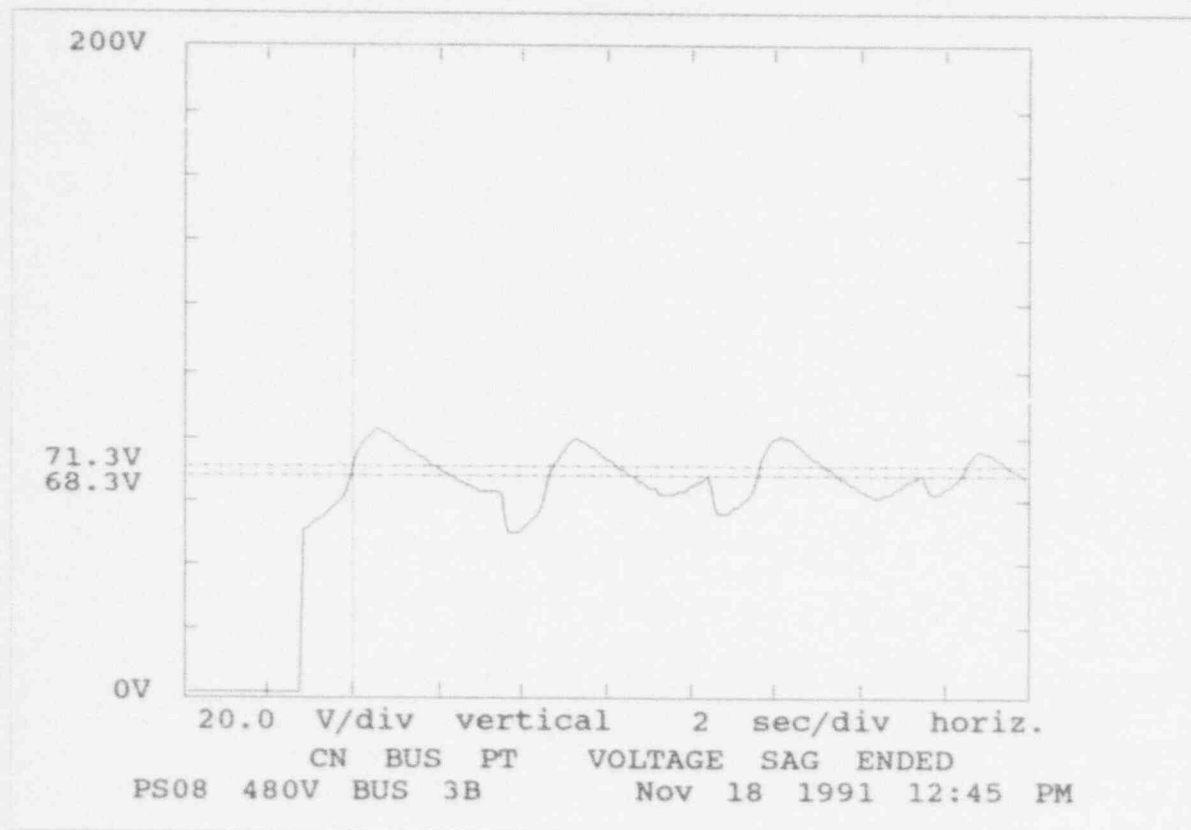


PS08 480V BUS 3B

Nov 18 1991

CN BUS PT VOLT. SAG END 12:44:10.89PM

0.0 Vrms minimum
82.7 Vrms maximum



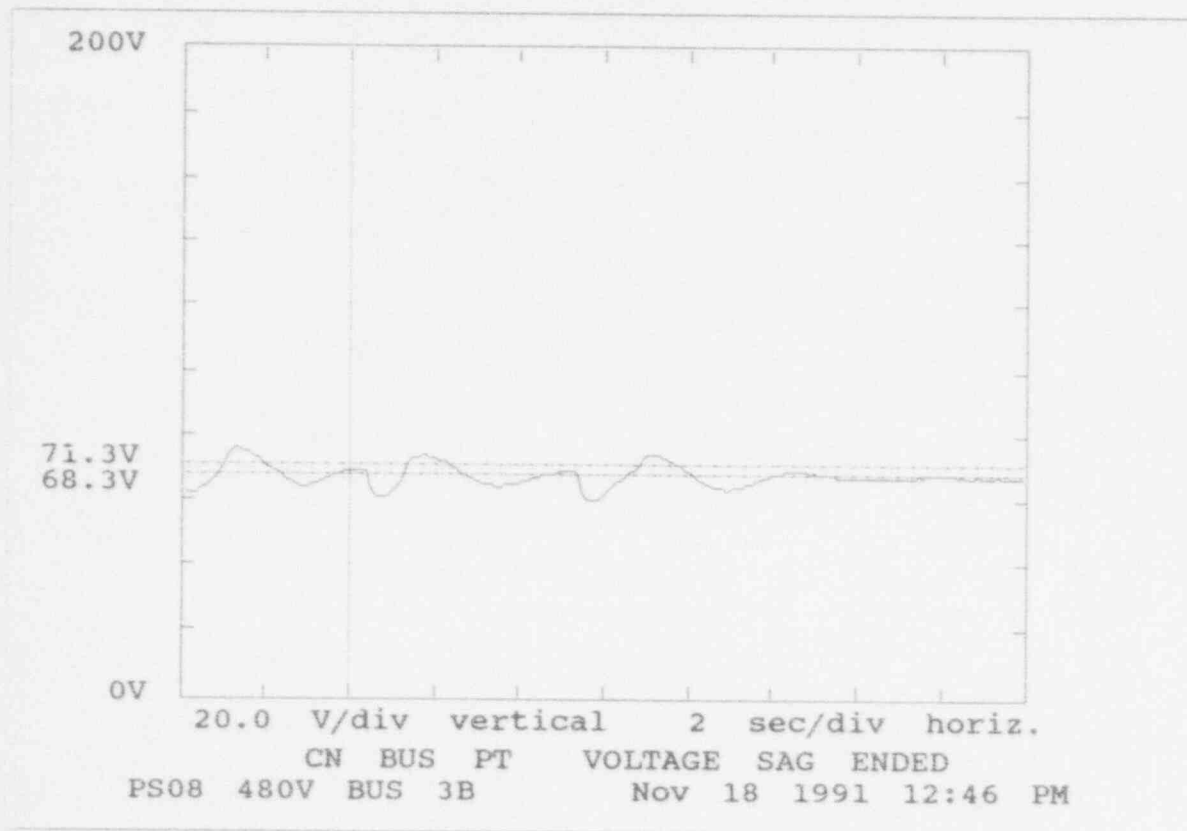
PS08 480V BUS 3B

Nov 18 1991

CN BUS PT VOLT. SAG END 12:44:29.07PM

59.7 Vrms minimum

75.8 Vrms maximum

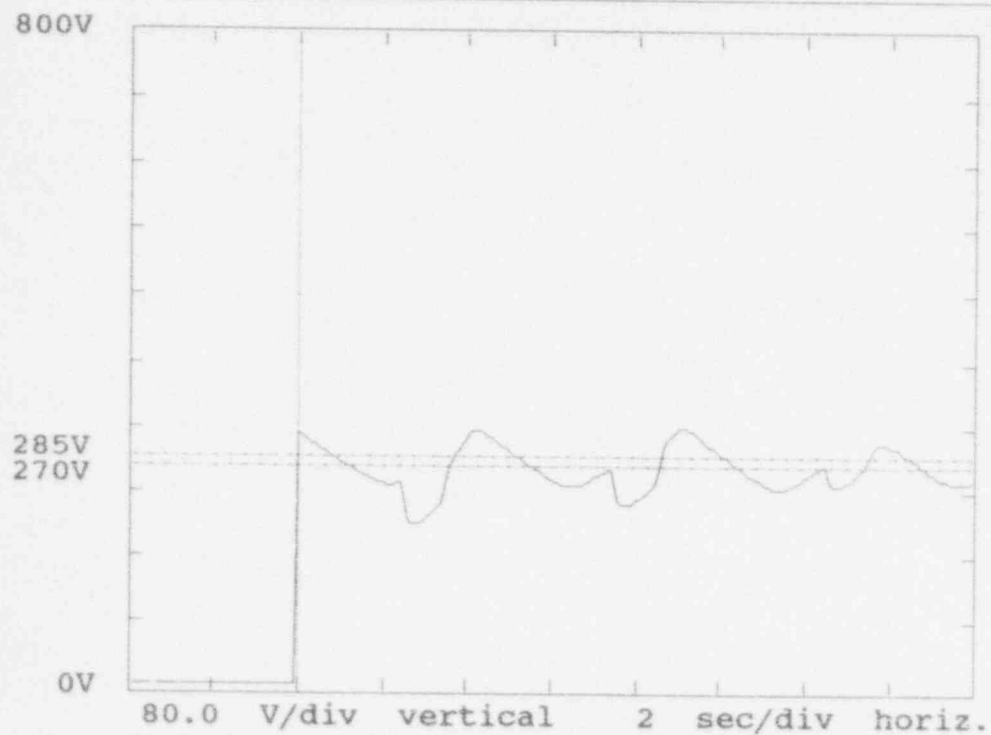


PS11 MCC 3B1

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:27.08PM

0.0 Vrms minimum
321.3 Vrms maximum



PHASE AN VOLTAGE SAG ENDED

PS11 MCC 3B1

Nov 18 1991 12:46 PM

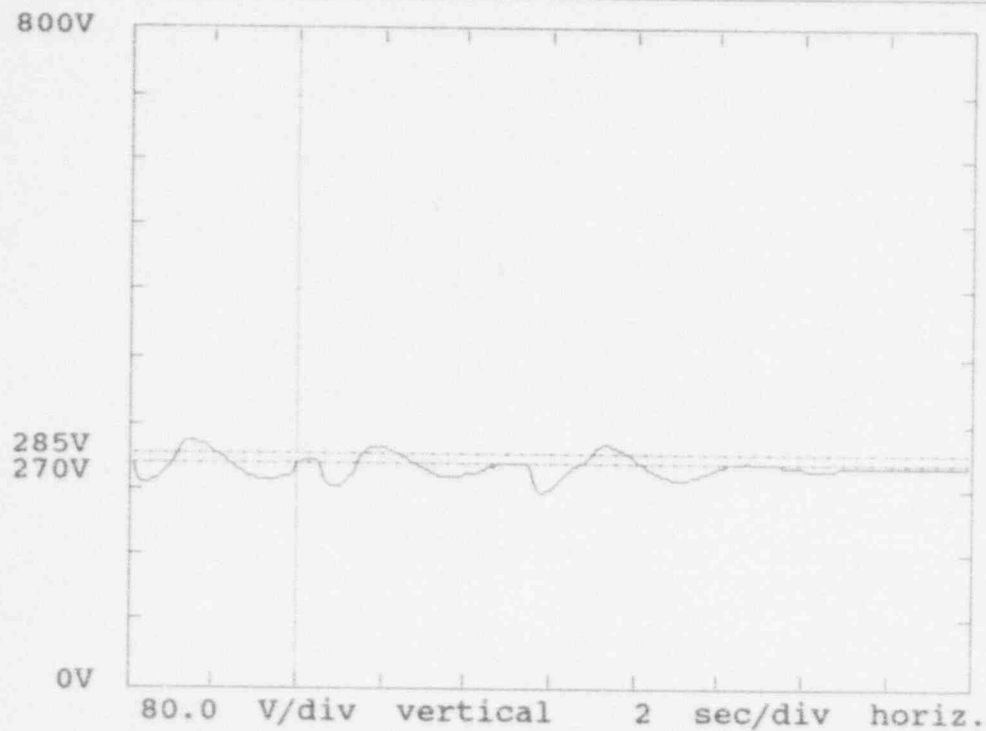
PS11 MCC 3B1

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:44.09PM

236.6 Vrms minimum

301.1 Vrms maximum



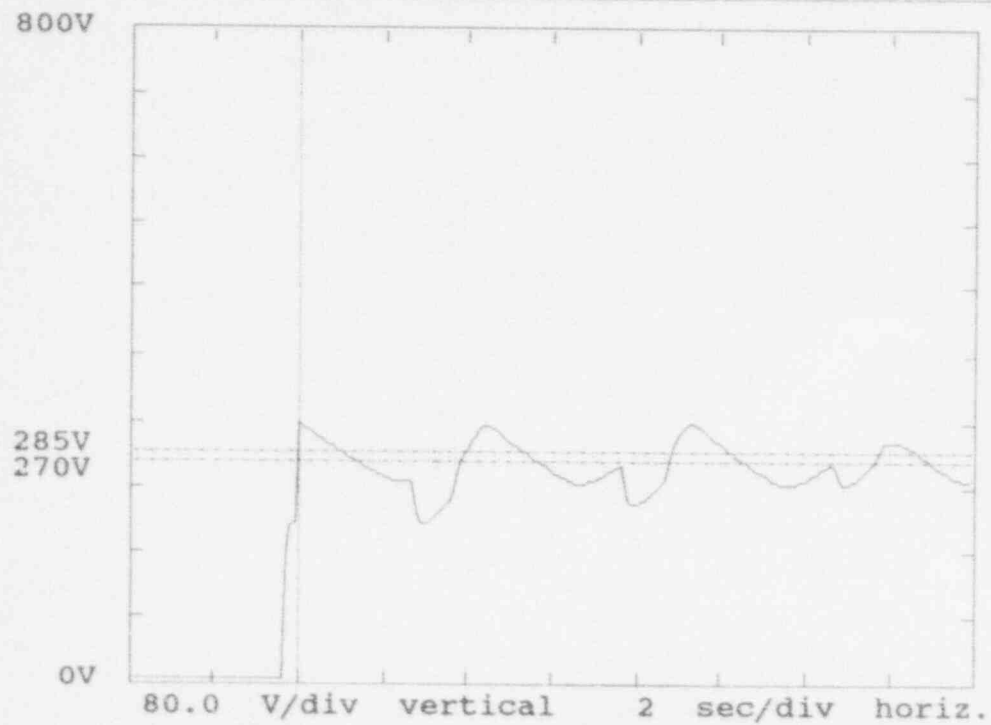
PHASE AN VOLTAGE SAG ENDED
PS11 MCC 3B1 Nov 18 1991 12:48 PM

PS11 MCC 3B1

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:26.87PM

0.0 Vrms minimum
319.9 Vrms maximum



PHASE BN VOLTAGE SAG ENDED
PS11 MCC 3B1 Nov 18 1991 12:46 PM

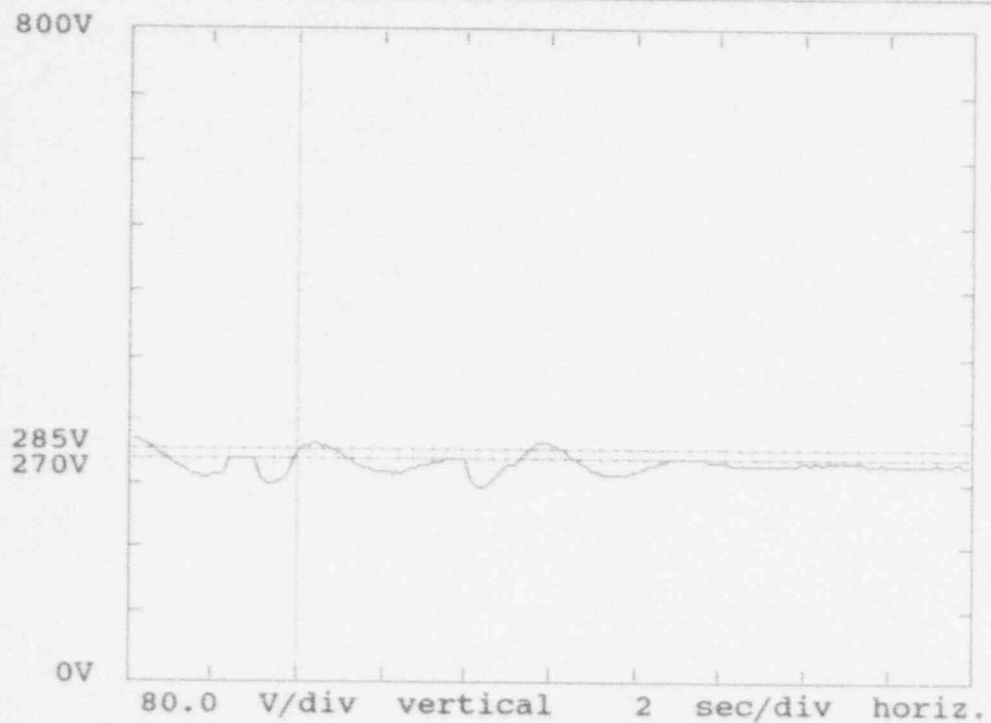
PS11 MCC 3B1

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:45.59PM

235.2 Vrms minimum

297.7 Vrms maximum



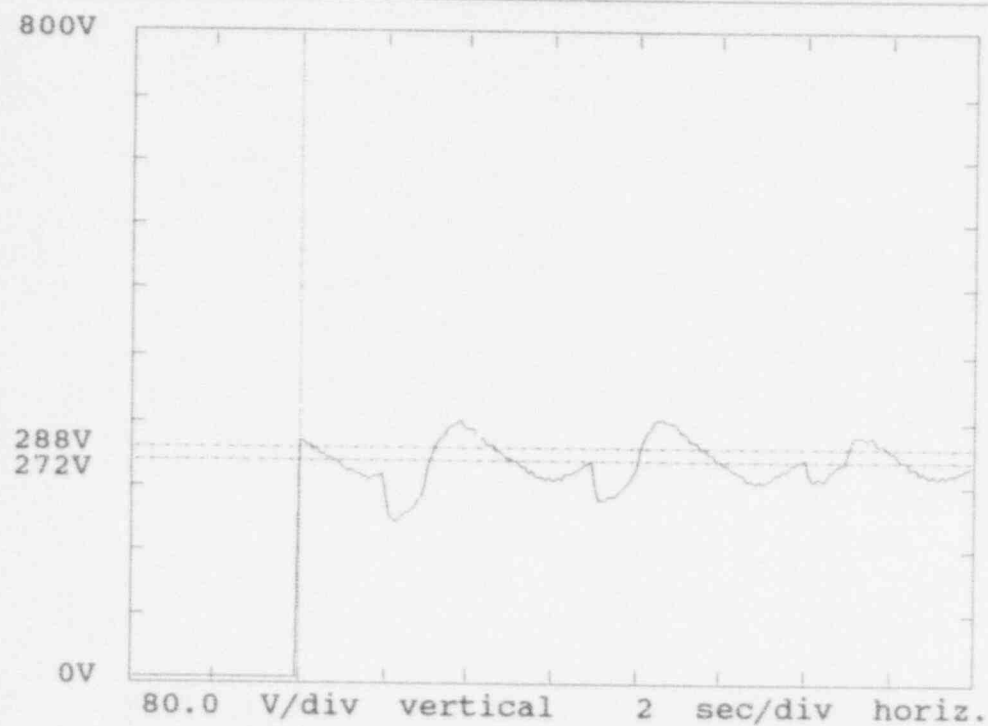
PHASE BN VOLTAGE SAG ENDED
PS11 MCC 3B1 Nov 18 1991 12:47 PM

PS11 MCC 3B1

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:27.54PM

0.0 Vrms minimum
325.7 Vrms maximum



PHASE CN VOLTAGE SAG ENDED
PS11 MCC 3B1 Nov 18 1991 12:47 PM

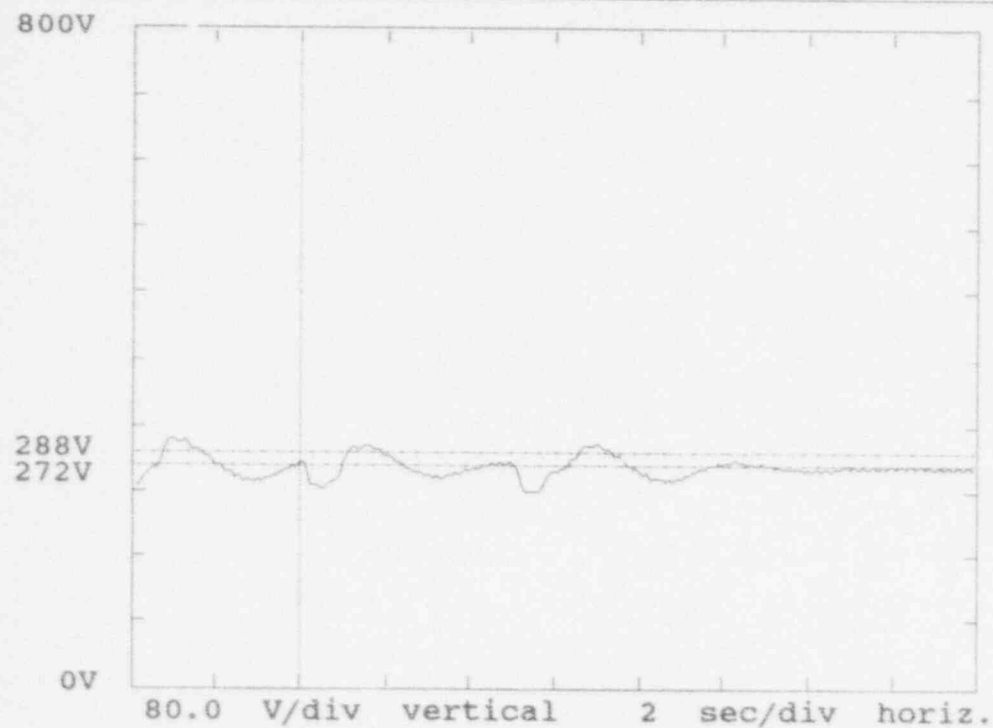
PS11 MCC 3B1

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:43.89PM

238.7 Vrms minimum

305.9 Vrms maximum



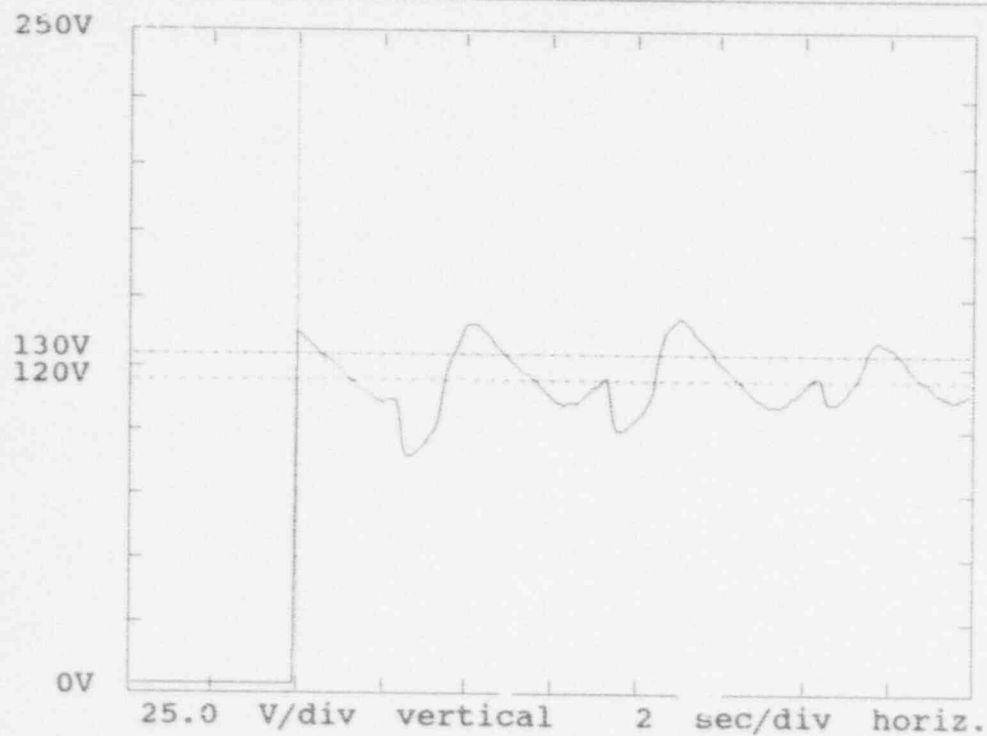
PS11 MCC 3B1 VOLTAGE SAG ENDED
Nov 18 1991 12:48 PM

PS11 MCC 3B1

Nov 18 1991

UNIT 3D VOLT. SAG END 12:44:27.16PM

0.0 Vrms minimum
143.8 Vrms maximum



UNIT 3D VOLTAGE SAG ENDED
PS11 MCC 3B1 Nov 18 1991 12:46 PM

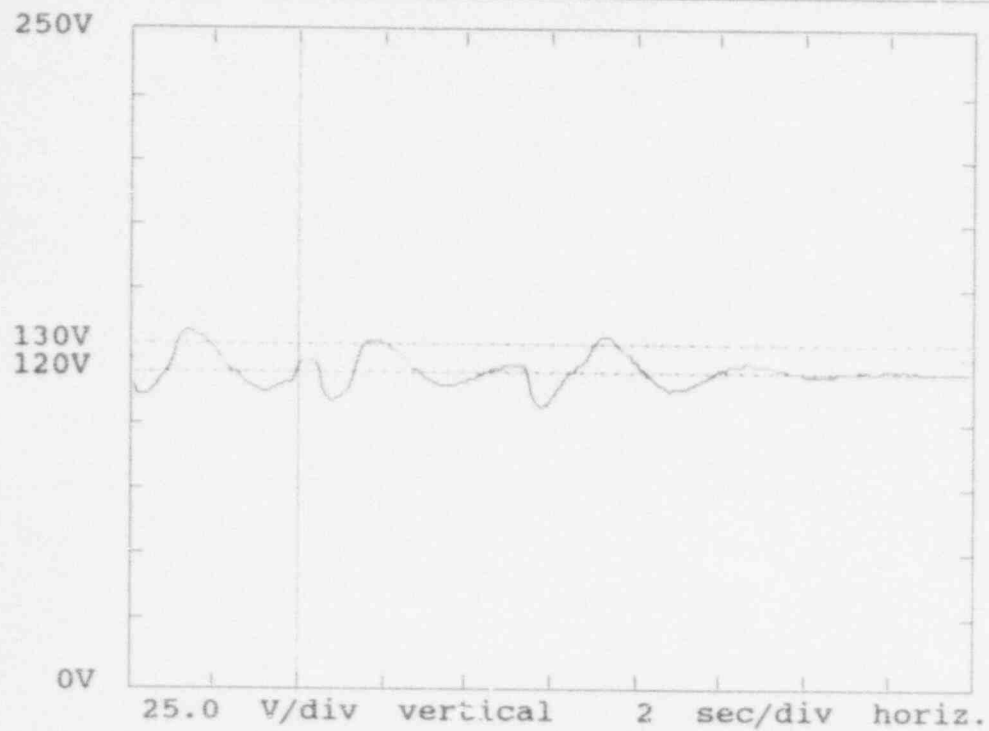
PS11 MCC 3B1

Nov 18 1991

UNIT 3D VOLT. SAG END 12:44:44.16PM

107.0 Vrms minimum

135.0 Vrms maximum



UNIT 3D
PS11 MCC 3B1

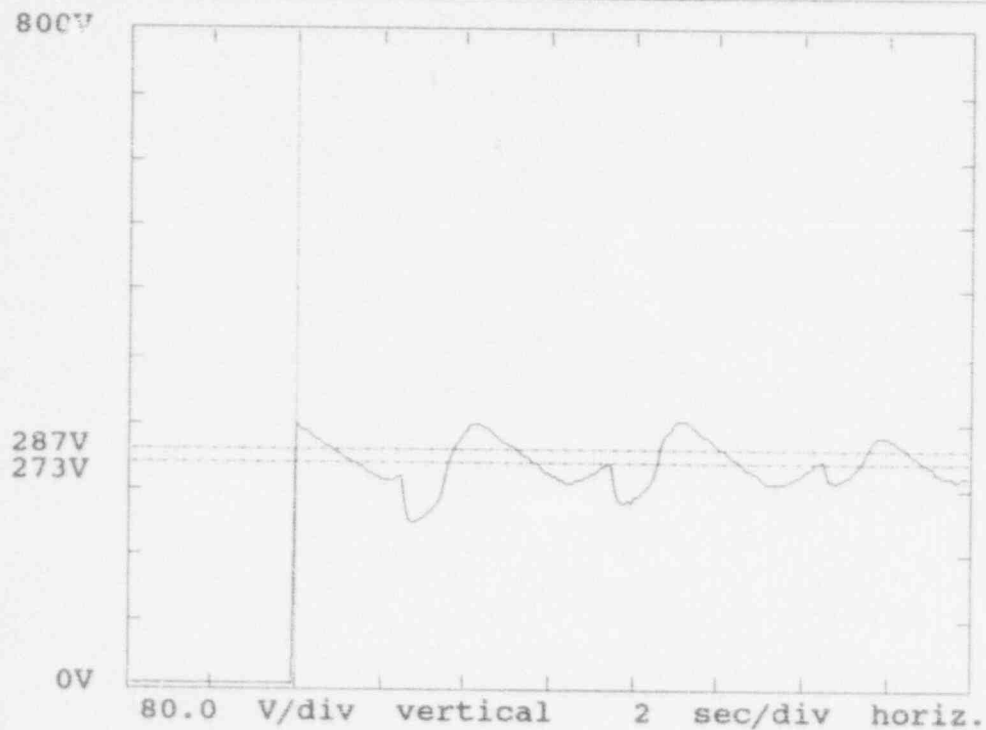
VOLTAGE SAG ENDED
Nov 18 1991 12:47 PM

PS12 MCC 3B2

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:08.81PM

0.0 Vrms minimum
324.8 Vrms maximum



PHASE AN VOLTAGE SAG ENDED
PS12 MCC 3B2 Nov 18 1991 12:46 PM

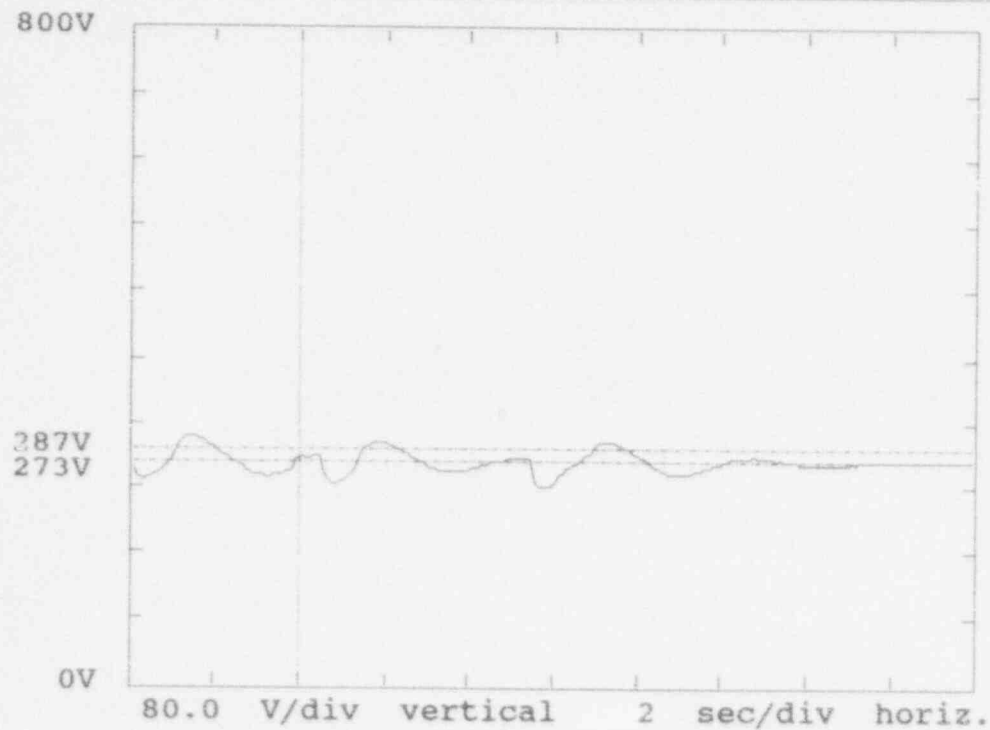
PS12 MCC 3B2

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:25.87PM

240.5 Vrms minimum

304.4 Vrms maximum



PHASE AN VOLTAGE SAG ENDED

PS12 MCC 3B2

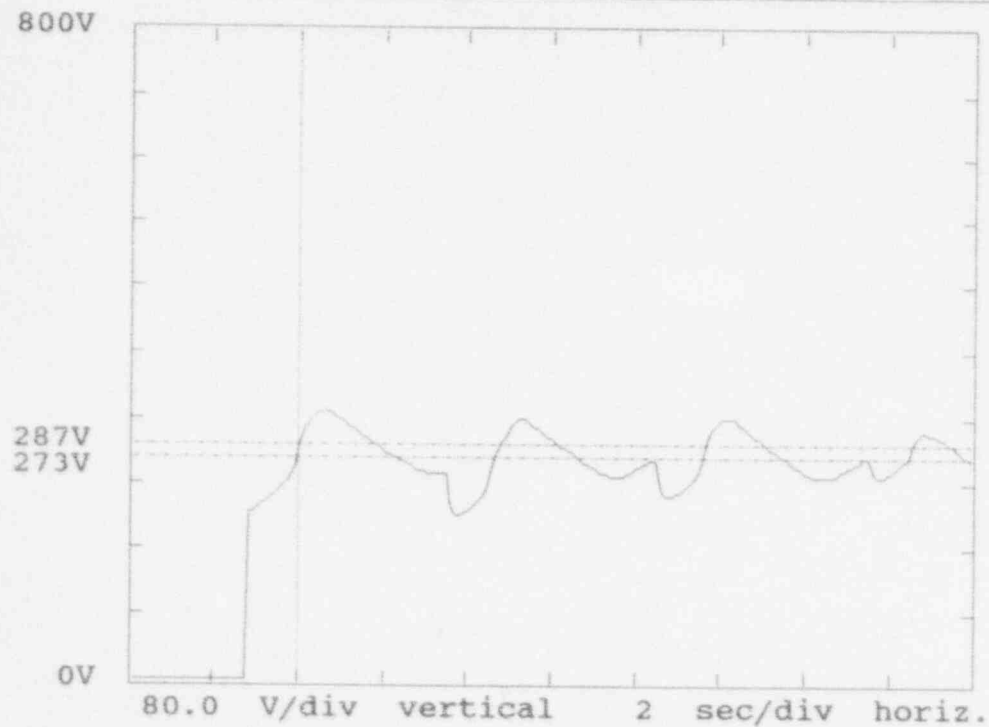
Nov 18 1991 12:47 PM

PS12 MCC 3B2

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:07.80PM

0.0 Vrms minimum
330.8 Vrms maximum



PHASE BN VOLTAGE SAG ENDED
PS12 MCC 3B2 Nov 18 1991 12:45 PM

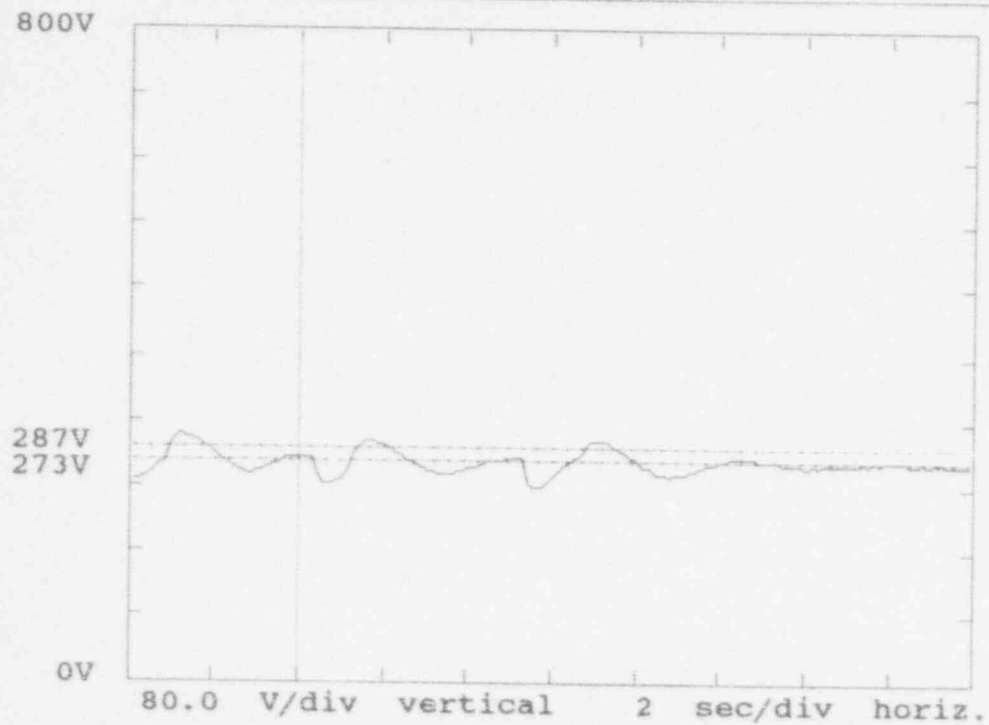
PS12 MCC 3B2

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:26.03PM

239.0 Vrms minimum

302.8 Vrms maximum



PHASE BN VOLTAGE SAG ENDED

PS12 MCC 3B2

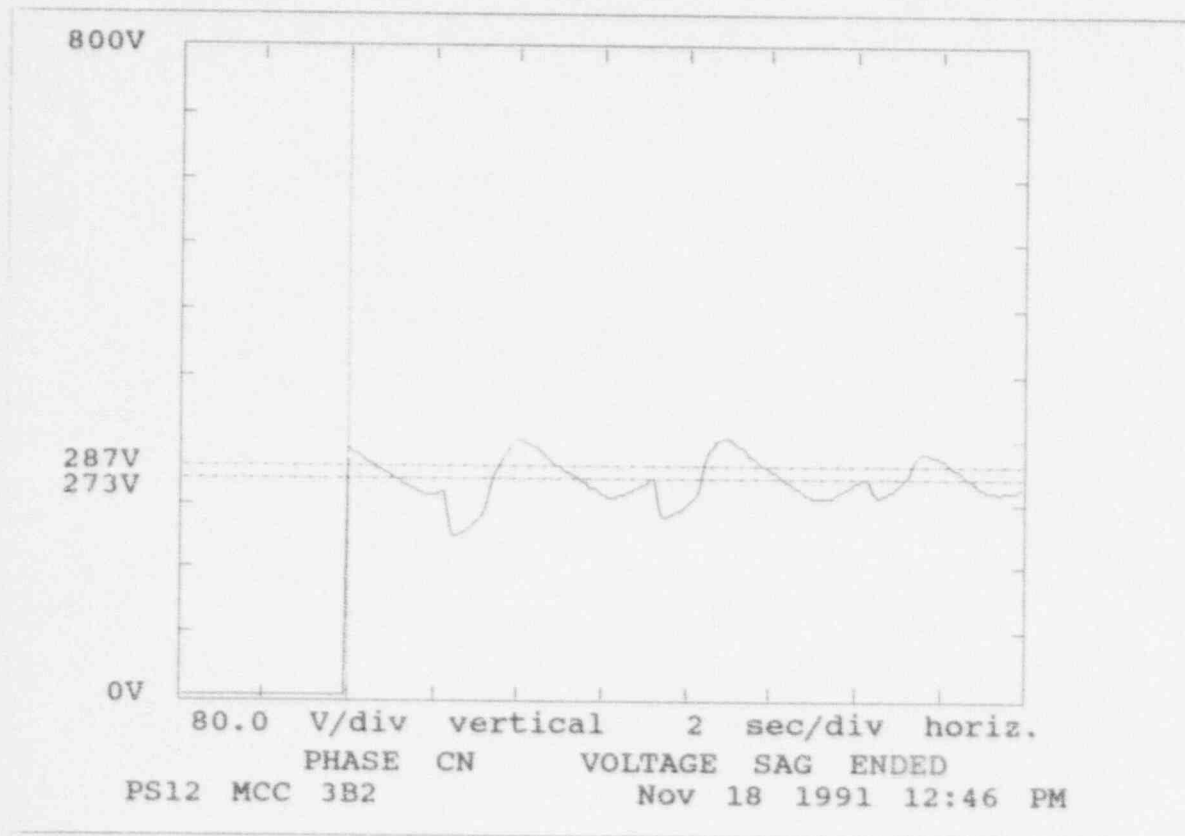
Nov 18 1991 12:46 PM

PS12 MCC 3B2

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:09.01PM

0.0 Vrms minimum
324.3 Vrms maximum



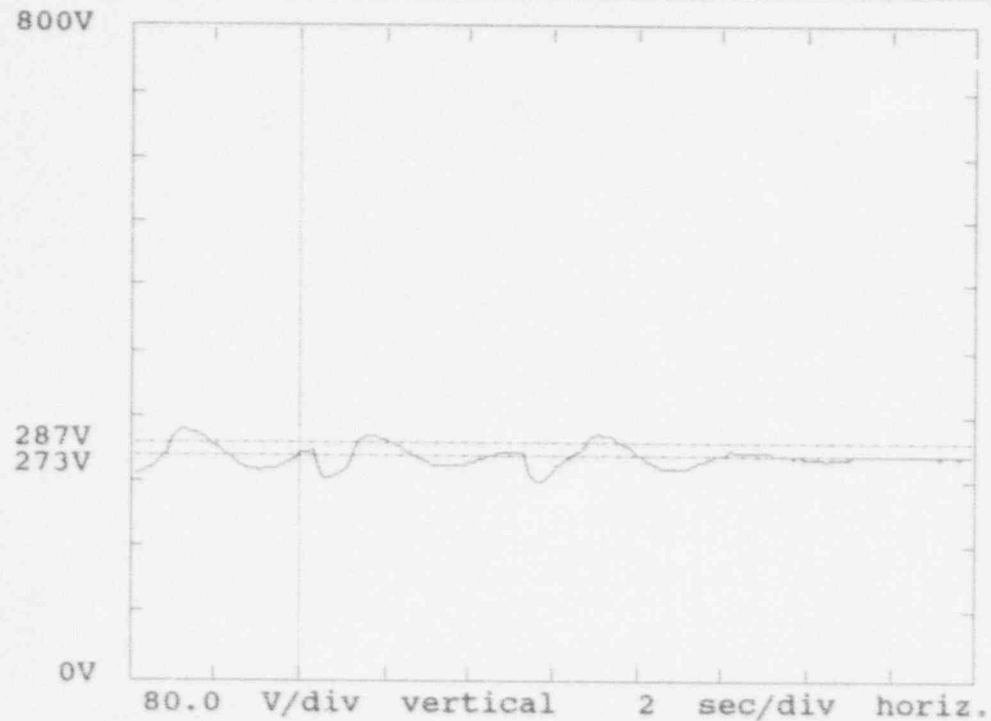
PS12 MCC 3B2

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:26.01PM

240.4 Vrms minimum

303.6 Vrms maximum



PHASE CN VOLTAGE SAG ENDED

PS12 MCC 3B2

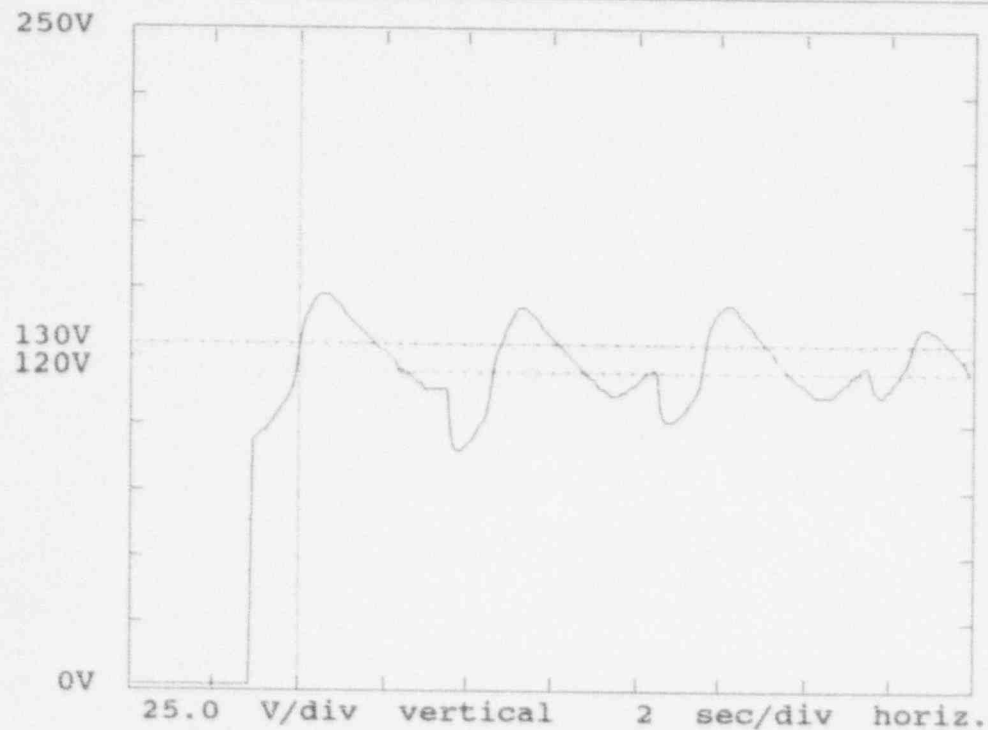
Nov 18 1991 12:47 PM

PS12 MCC 3B2

Nov 18 1991

UNIT 6B VOLT. SAG END 12:44:07.78PM

0.0 Vrms minimum
149.3 Vrms maximum



UNIT 6B VOLTAGE SAG ENDED
PS12 MCC 3B2 Nov 18 1991 12:45 PM

PS12 MCC 3B2

Nov 18 1991

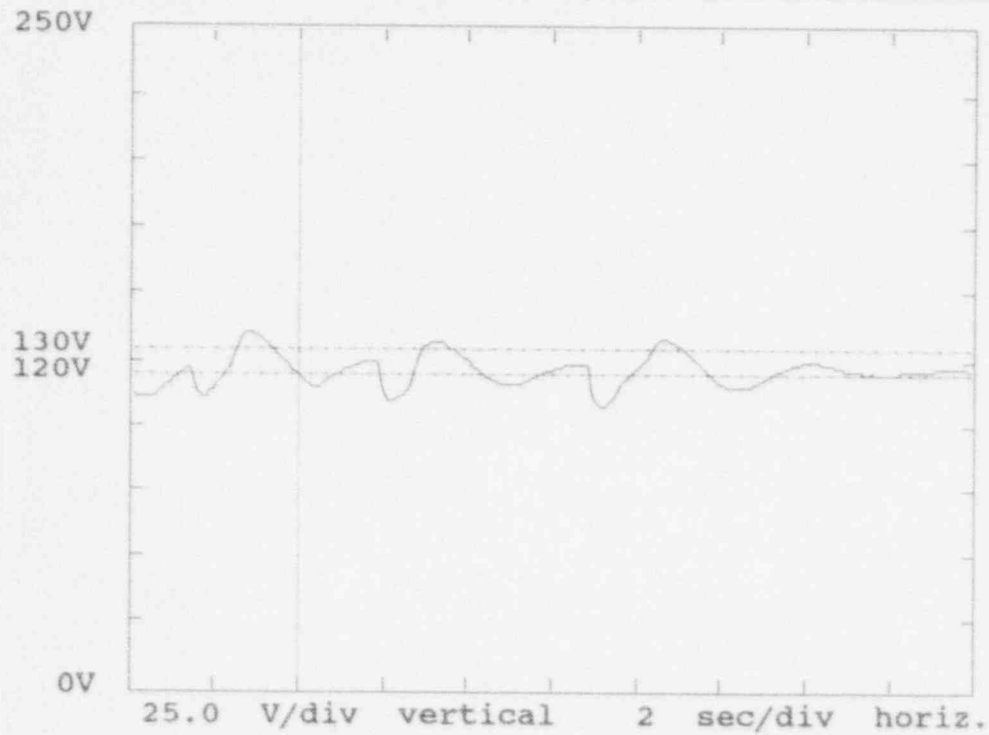
UNIT 6B VOLTAGE SAG 12:44:23.93PM

107.7 Vrms minimum

136.1 Vrms maximum

7.5 seconds below threshold

2.3 seconds above threshold



UNIT 6B
PS12 MCC 3B2

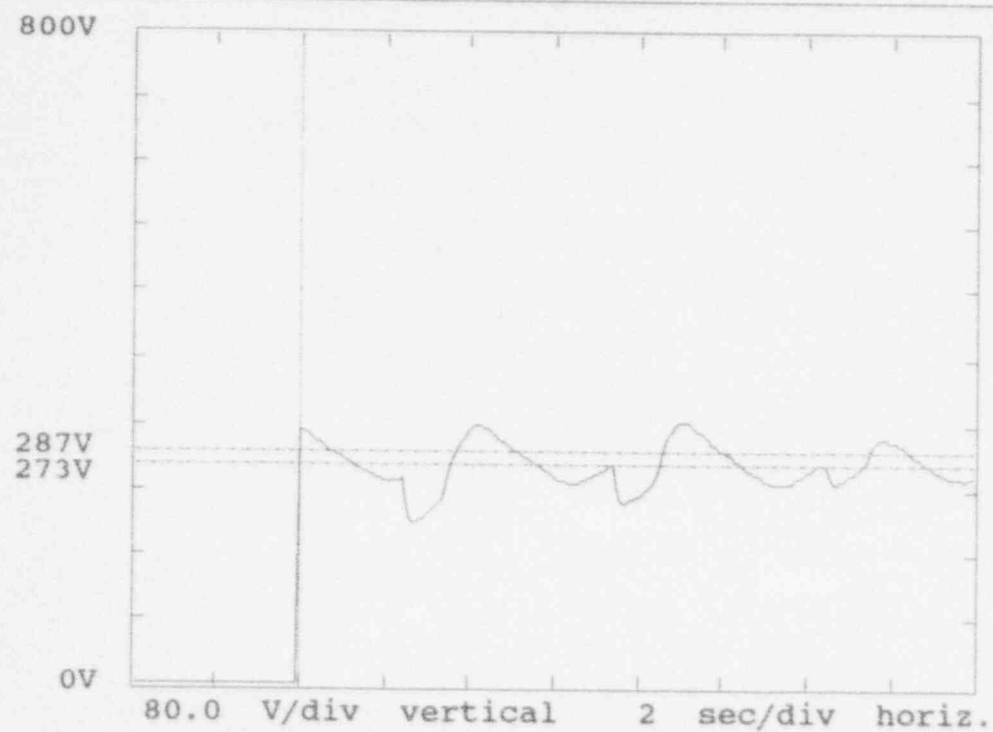
VOLTAGE SAG
Nov 18 1991 12:47 PM

PS09 MCC 3B3

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:07.56PM

0.0 Vrms minimum
324.4 Vrms maximum



PHASE AN VOLTAGE SAG ENDED
PS09 MCC 3B3 Nov 18 1991 12:45 PM

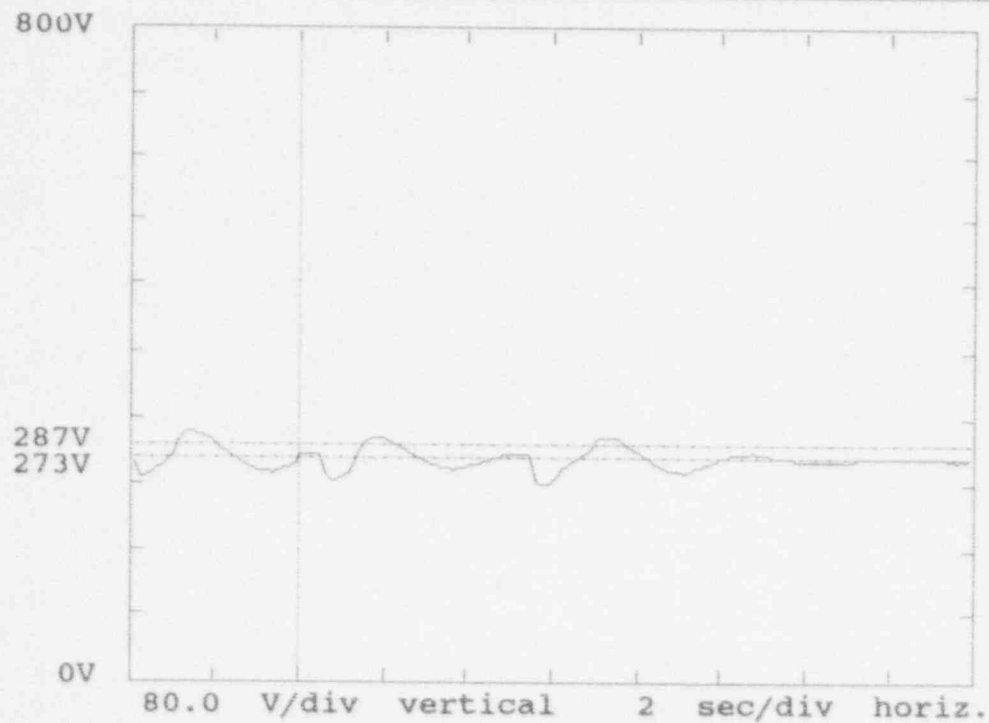
PS09 MCC 3B3

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:24.54PM

240.0 Vrms minimum

304.1 Vrms maximum



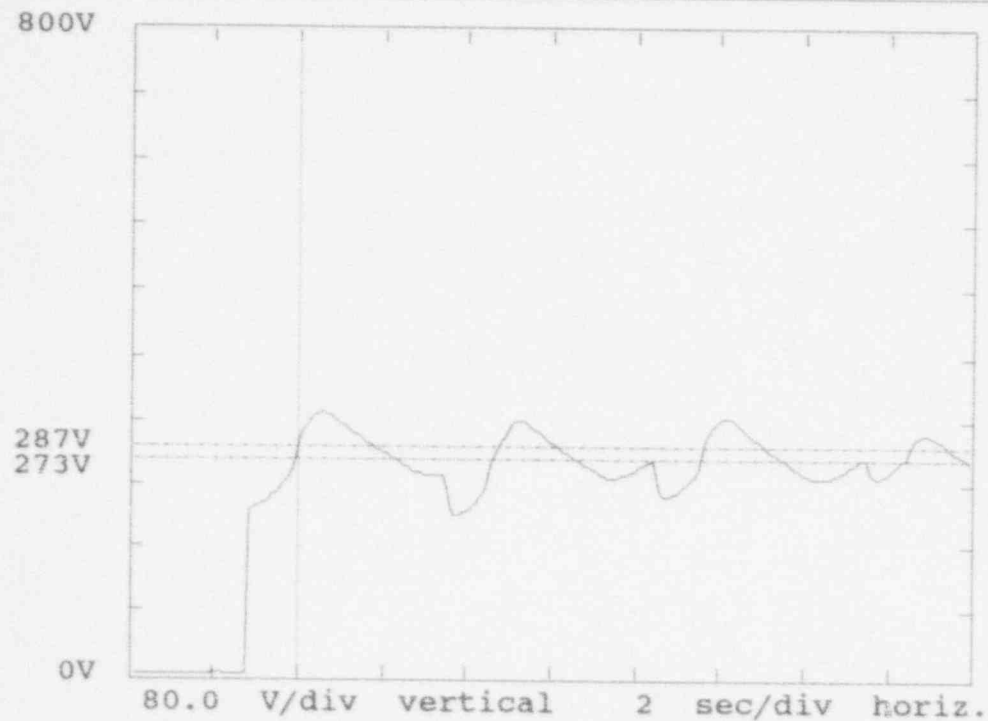
PHASE AN VOLTAGE SAG ENDED
PS09 MCC 3B3 Nov 18 1991 12:47 PM

PS09 MCC 3B3

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:06.50PM

0.0 Vrms minimum
333.9 Vrms maximum



PHASE BN VOLTAGE SAG ENDED
PS09 MCC 3B3 Nov 18 1991 12:45 PM

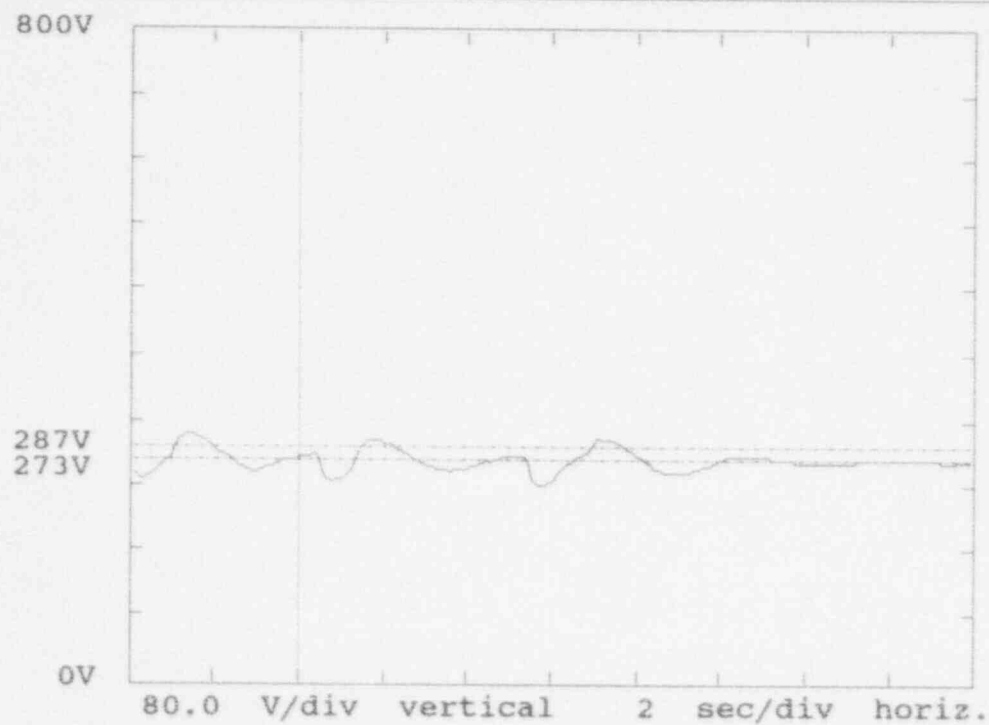
PS09 MCC 3B3

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:24.61PM

239.3 Vrms minimum

303.8 Vrms maximum



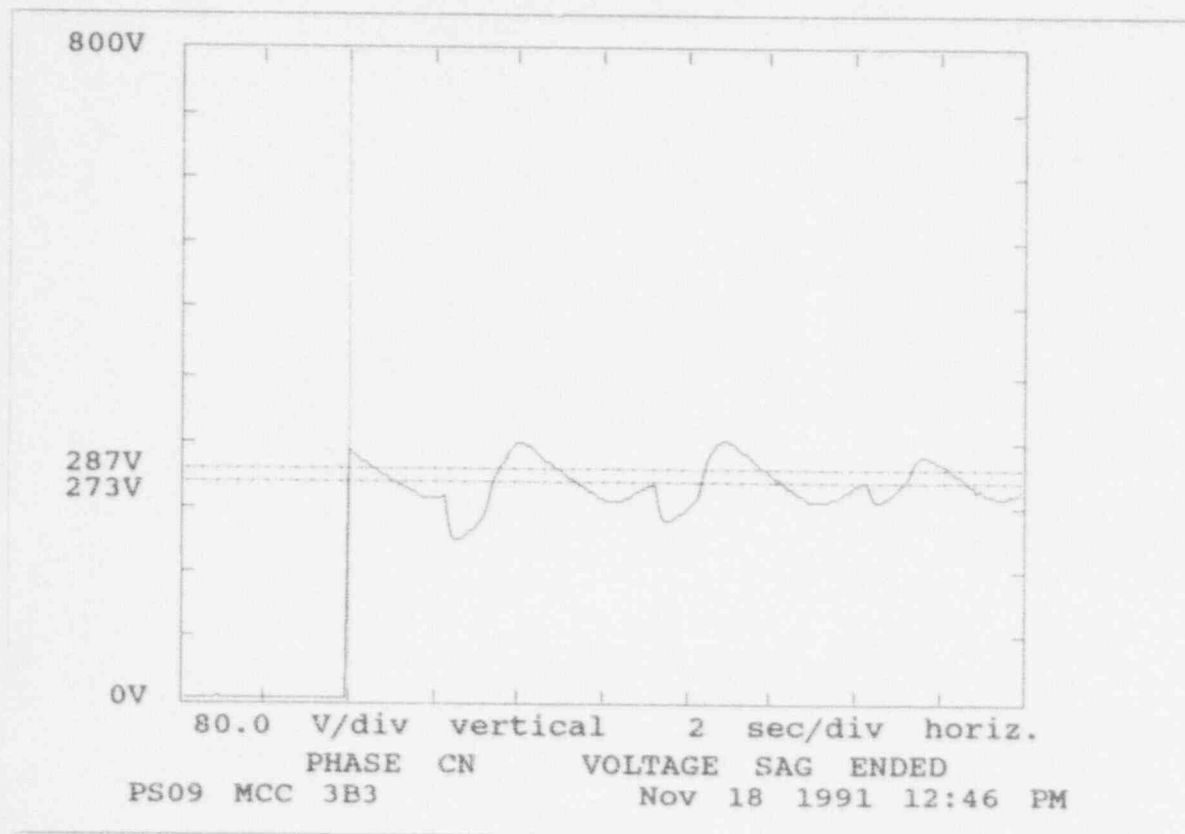
PHASE BN VOLTAGE SAG ENDED
PS09 MCC 3B3 Nov 18 1991 12:46 PM

PS09 MCC 3B3

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:07.71PM

0.0 Vrms minimum
323.2 Vrms maximum



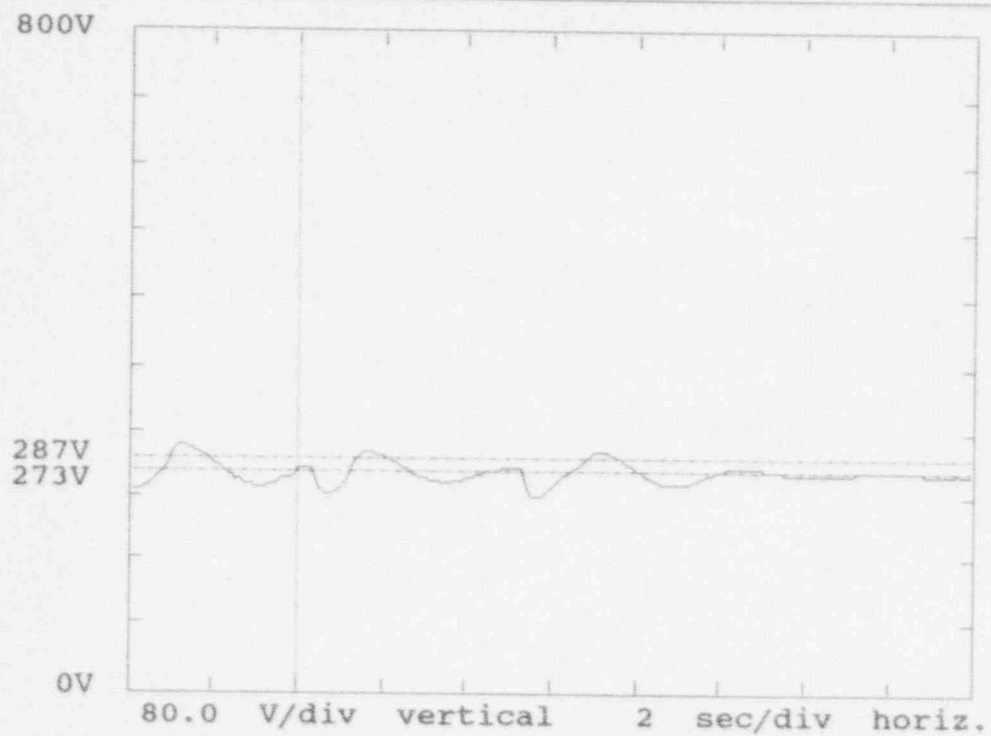
PS09 MCC 3B3

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:24.72PM

239.1 Vrms minimum

302.4 Vrms maximum



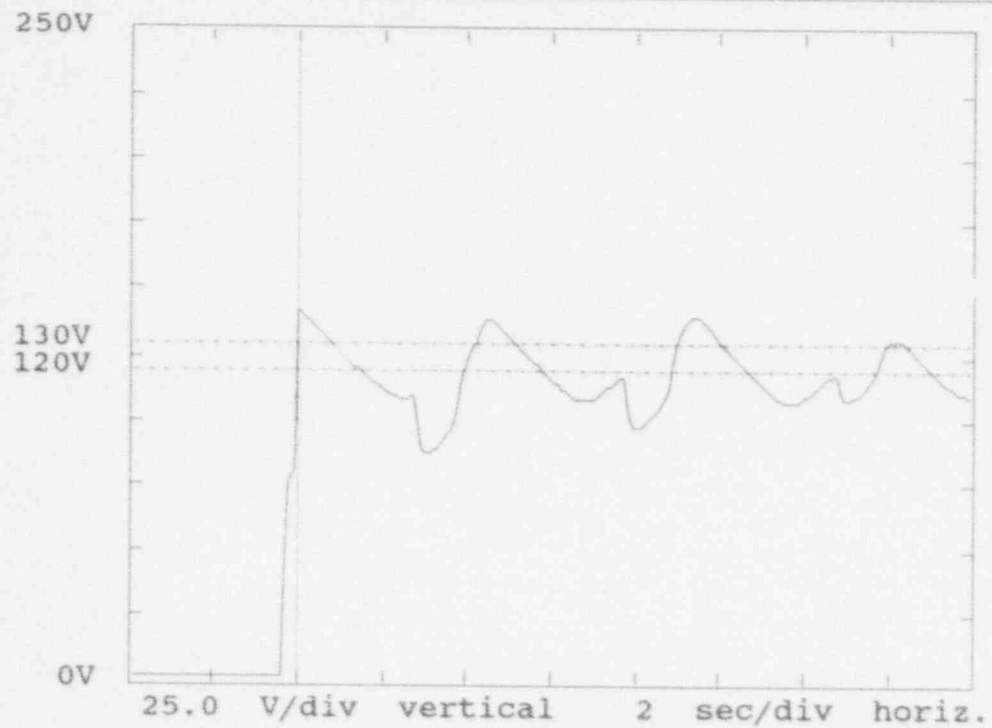
PHASE CN VOLTAGE SAG ENDED
PS09 MCC 3B3 Nov 18 1991 12:47 PM

PS09 MCC 3B3

Nov 18 1991

UNIT 2KN VOLT. SAG END 12:44:07.23PM

0.6 Vrms minimum
142.1 Vrms maximum



UNIT 2KN
PS09 MCC 3B3

VOLTAGE SAG ENDED
Nov 18 1991 12:45 PM

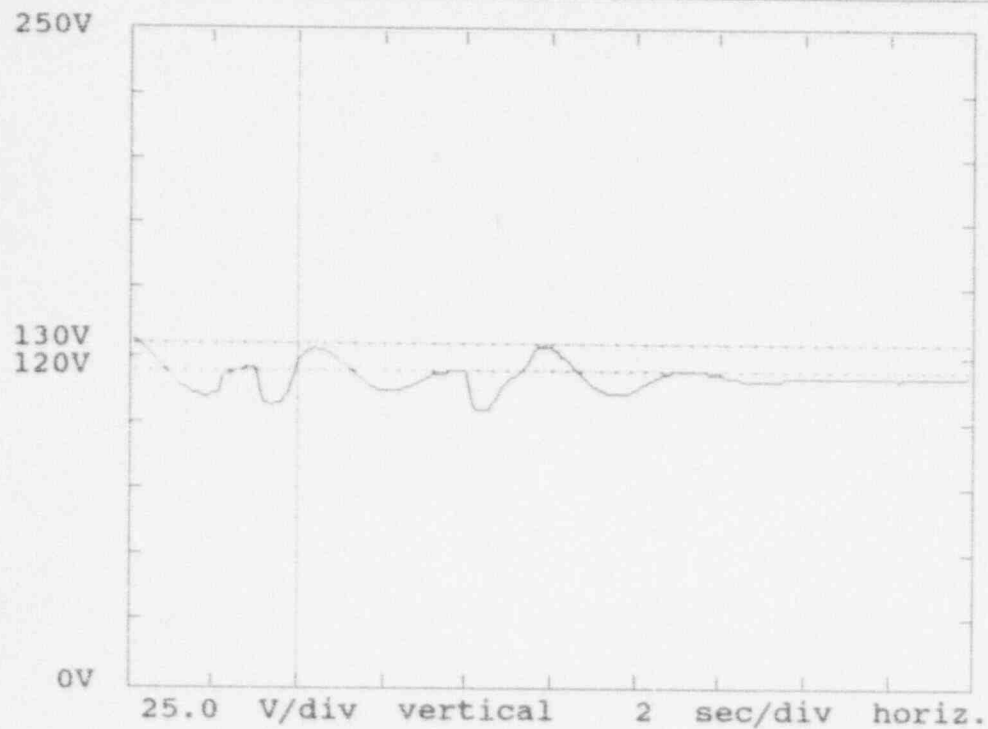
PS09 MCC 3B3

Nov 18 1991

UNIT 2KN VOLT. SAG END 12:44:26.04PM

104.4 Vrms minimum

131.0 Vrms maximum



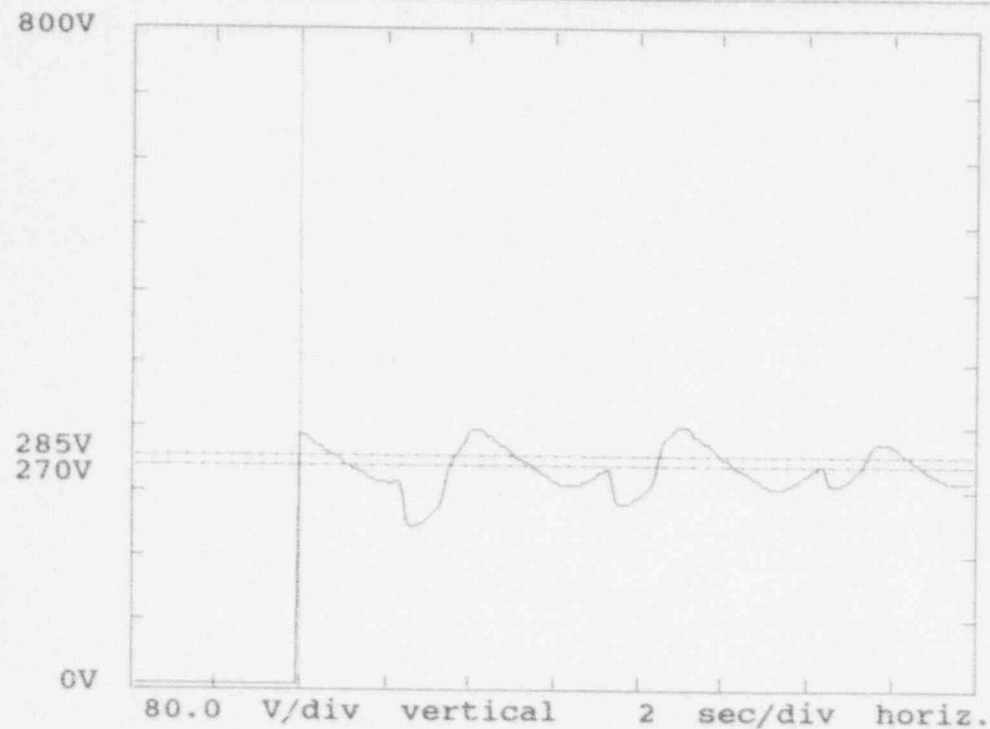
UNIT 2KN VOLTAGE SAG ENDED
PS09 MCC 3B3 Nov 18 1991 12:46 PM

PS10 MCC 3AB

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:21.54PM

0.0 Vrms minimum
321.1 Vrms maximum



PHASE AN VOLTAGE SAG ENDED
PS10 MCC 3AB Nov 18 1991 12:46 PM

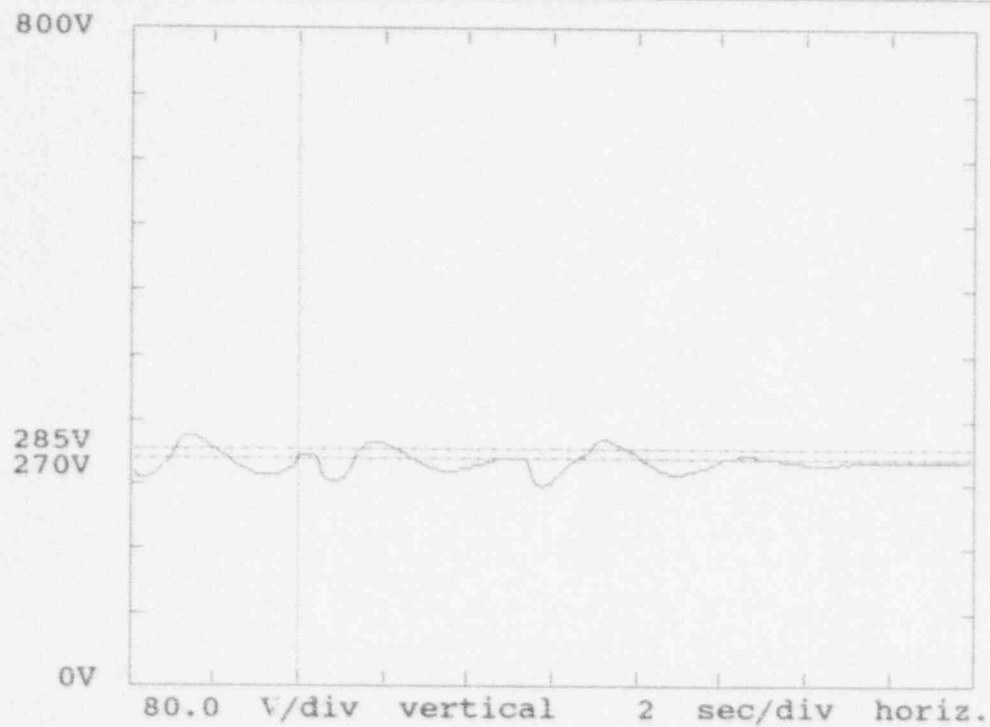
PS10 MCC 3AB

Nov 18 1991

PHASE AN VOLT. SAG END 12:44:38.54PM

237.7 Vrms minimum

301.1 Vrms maximum



PHASE AN VOLTAGE SAG ENDED

PS10 MCC 3AB

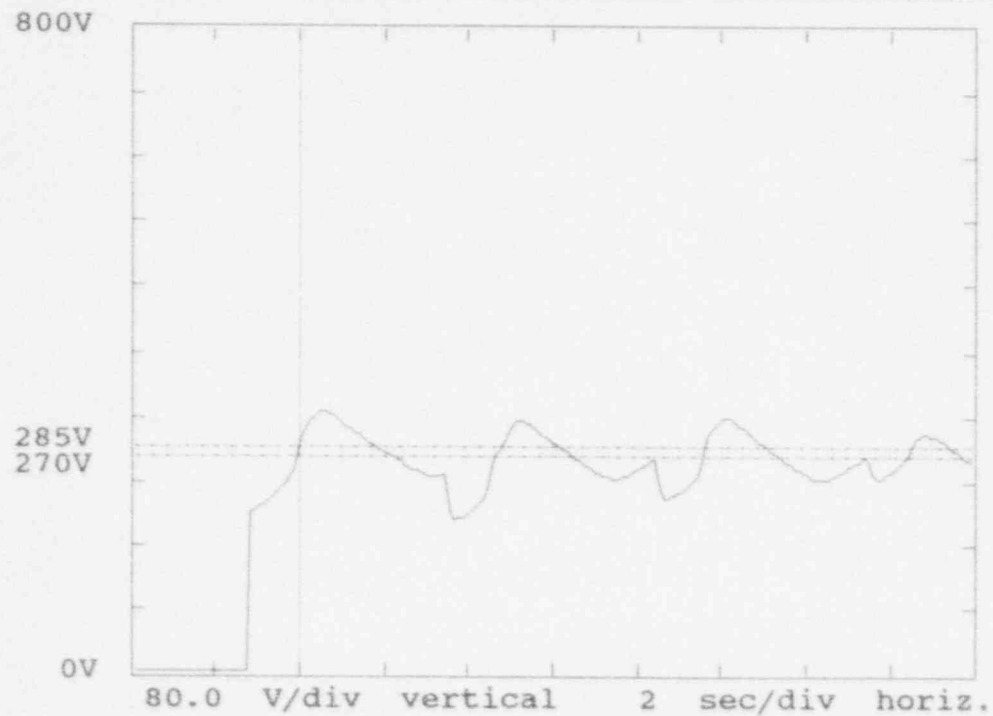
Nov 18 1991 12:47 PM

PS10 MCC 3AB

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:20.45PM

0.0 Vrms minimum
328.6 Vrms maximum



PHASE BN VOLTAGE SAG ENDED
PS10 MCC 3AB Nov 18 1991 12:45 PM

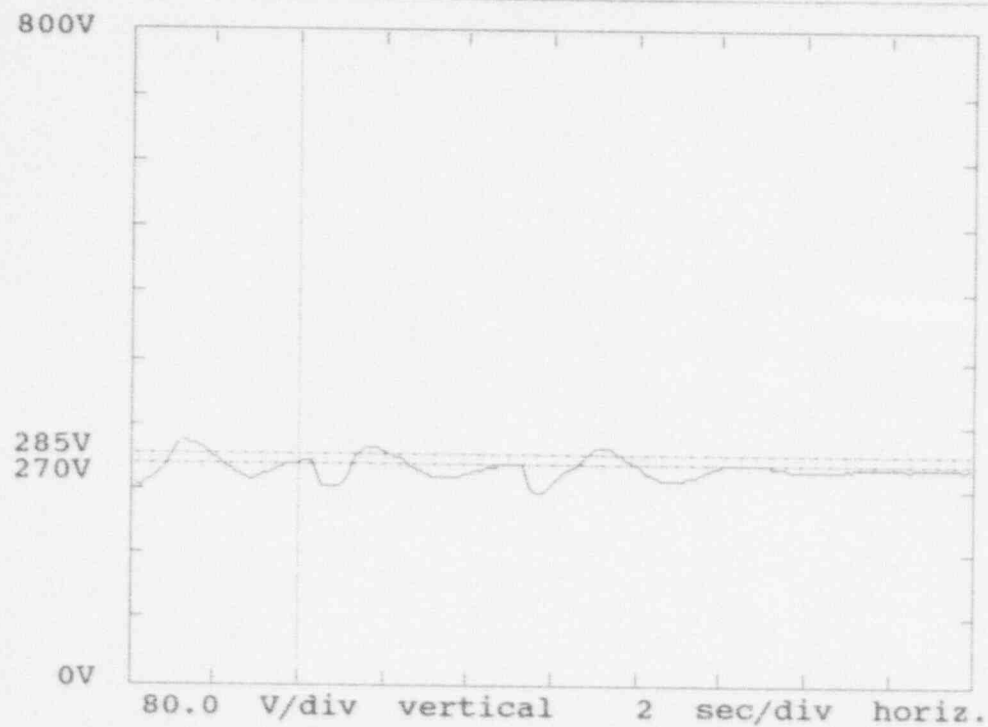
PS10 MCC 3AB

Nov 18 1991

PHASE BN VOLT. SAG END 12:44:38.63PM

235.3 Vrms minimum

299.4 Vrms maximum



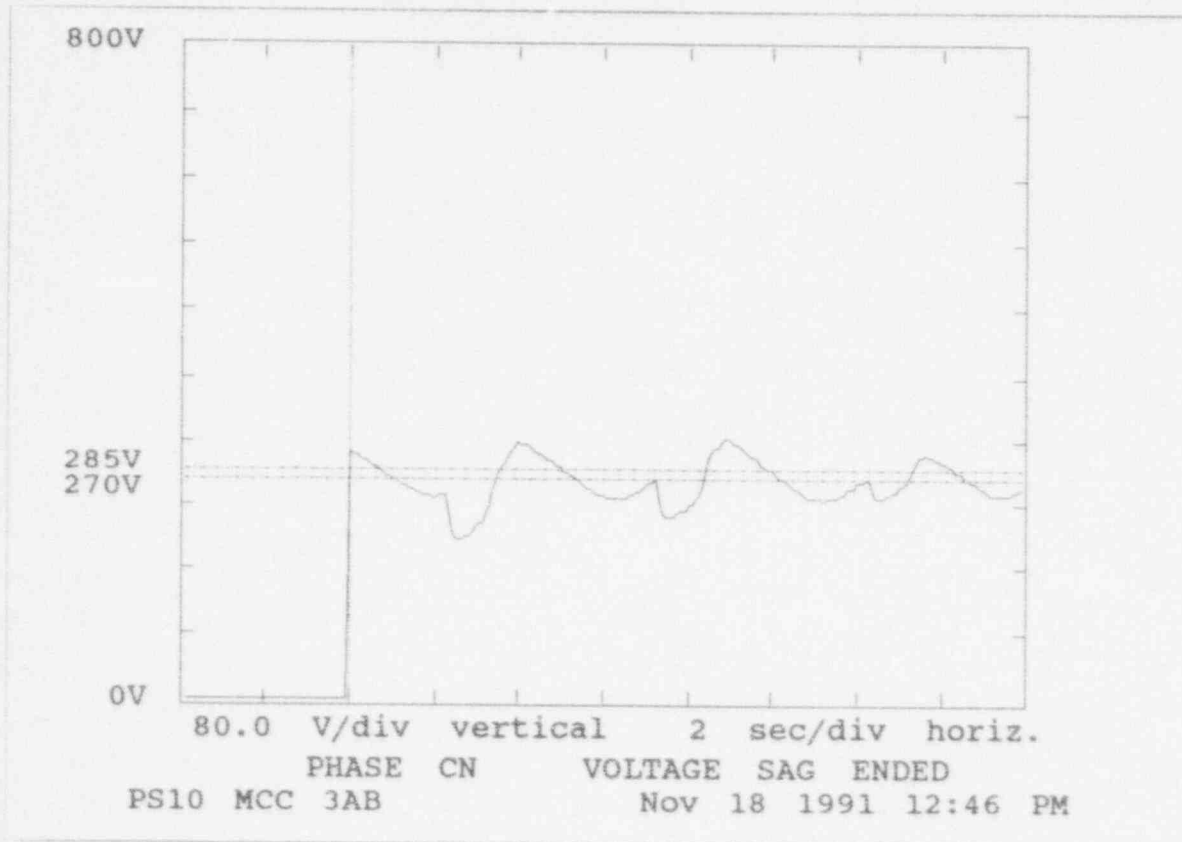
PHASE BN VOLTAGE SAG ENDED
PS10 MCC 3AB Nov 18 1991 12:47 PM

PS10 MCC 3AB

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:21.63PM

0.0 Vrms minimum
323.0 Vrms maximum



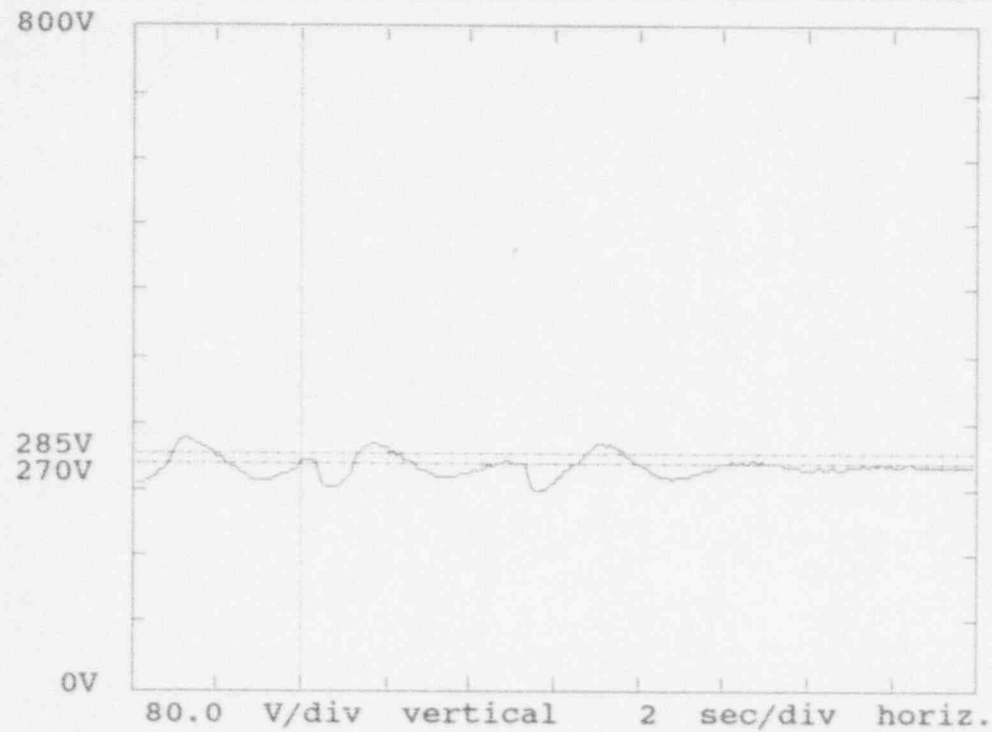
PS10 MCC 3AB

Nov 18 1991

PHASE CN VOLT. SAG END 12:44:38.63PM

238.9 Vrms minimum

302.6 Vrms maximum



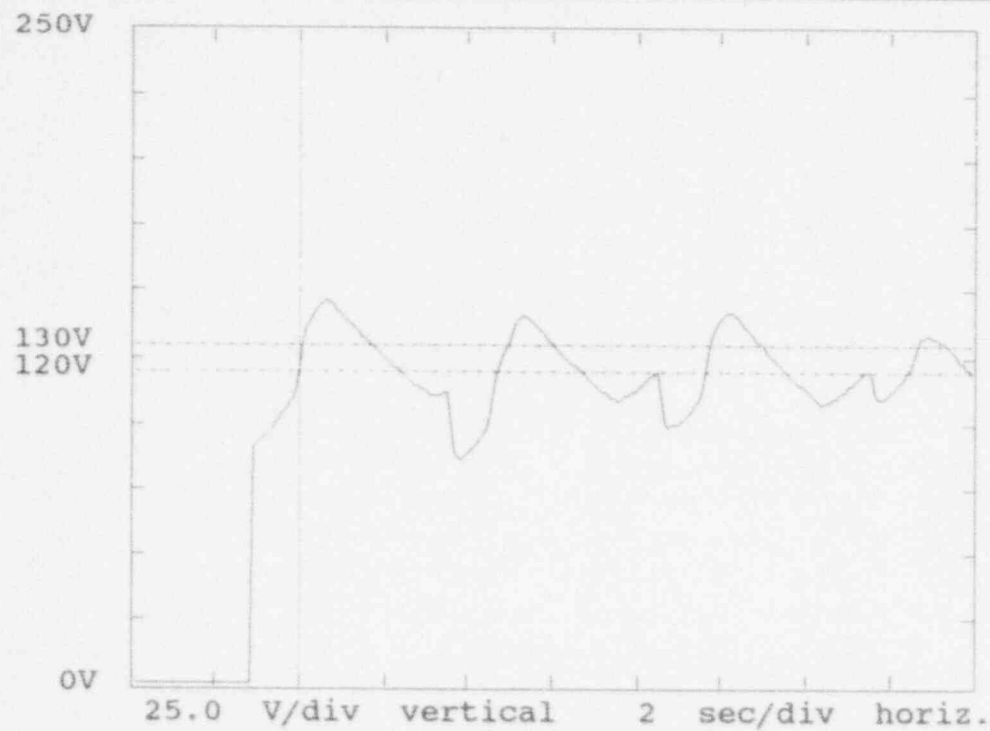
PHASE CN VOLTAGE SAG ENDED
PS10 MCC 3AB Nov 18 1991 12:47 PM

PS10 MCC 3AB

Nov 18 1991

UNIT 3C VOLT. SAG END 12:44:20.38PM

0.0 Vrms minimum
147.0 Vrms maximum



UNIT 3C
PS10 MCC 3AB

VOLTAGE SAG ENDED
Nov 18 1991 12:46 PM

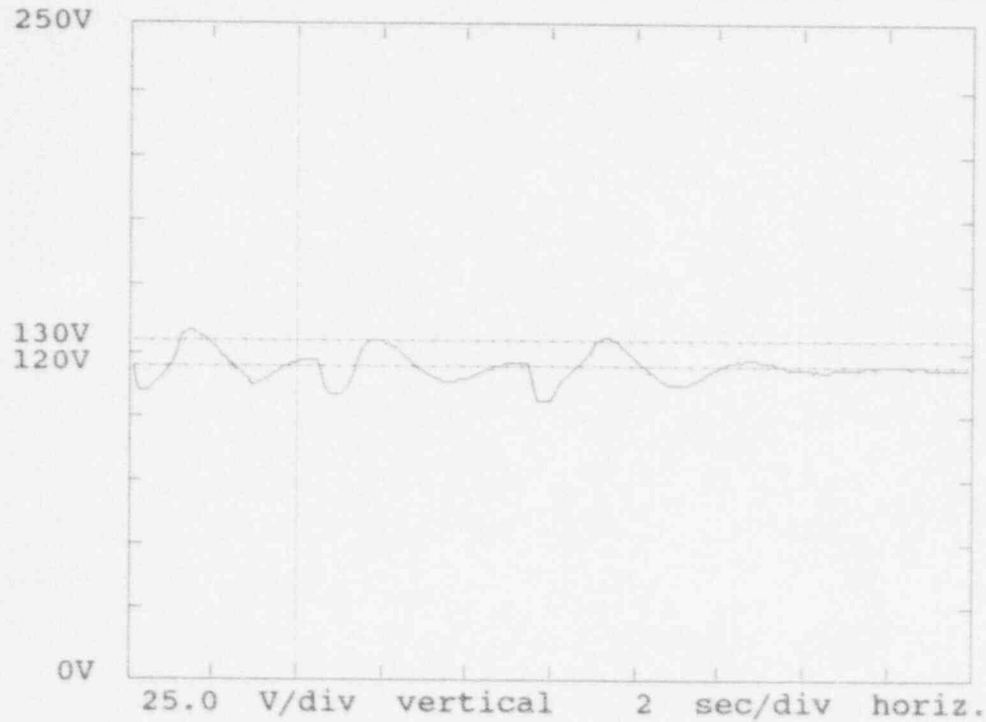
PS10 MCC 3AB

Nov 18 1991

UNIT 3C VOLT. SAG END 12:44:38.48PM

106.0 Vrms minimum

133.8 Vrms maximum



UNIT 3C

VOLTAGE SAG ENDED

PS10 MCC 3AB

Nov 18 1991 12:47 PM