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Component Fragility Research Program Phase I Demonstration Tests Volume 2: Appendices

G. S. Holman, C. K. Chou, G. D. Shipway, V. Glozman

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U.S. Nuclear Regulatory Commission

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Component Fragility Research Program Phase I Demonstration Tests

Volume 2: Appendices

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**Prepared for
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Washington, D.C. 20555
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APPENDIX A

Details of Controller and Relay Installation

A-1

h-2

APPENDIX A

This appendix presents "open-door" photographs of each compartment in the motor control center tested. MCC columns are numbered left to right, and are divided into 12 6-inch high spaces A through M between the top and bottom horizontal raceways. Compartments are identified according to the following designation code:

Compartment "2J" is therefore located in the second column and has its bottom at elevation "J" (i.e., 27 inches from the cabinet base). Note that the compartments themselves vary from 12 to 24 inches in height.

Figure A-1 diagrams the general arrangement of motor controllers, relays, and accelerometers in the motor control center. Controllers are identified according to starter size; an "S-2" controller, for example, uses a NEMA Size 2 starter. Reversing controllers are identified by an "R" suffix. Westinghouse, General Electric, and Cutler-Hammer relays are identified according to manufacturer (i.e., "W", "GE", and "CH") while Square-D relays are identified according to model (i.e., "KX" and "KP"). Accelerometer locations are identified by numbered circles (horizontal orientation) or squares (vertical orientation).

Fig. A-1. General arrangement of controllers, relays, and accelerometers during MCC testing.

Fig. A-2. Detail of MCC compartment 1C (Westinghouse Size 3 FVNR controller).

Fig. A-3. Detail of MCC compartment 1G (Westinghouse Size 2 FVNR controller).

Fig. A-4. Detail of MCC compartment 1J (Westinghouse Type AR relay, Square-D Type KP relay).

Fig. A-5. Detail of MCC compartment 1M (Westinghouse Size 3 FVNR controller).

Fig. A-6. Detail of MCC compartment 2B (Westinghouse Type AR relay, Square-D Type X relay).

Fig. A-7. Detail of MCC compartment 2E (Westinghouse Size 2 FVR controller).

Fig. A-8. Detail of MCC compartment 2J (Westinghouse Type AR relay, General Electric Type CR relay, Cutler-Hammer Powerreed relay, Square-D Type X and Type KP relays).

Fig. A-9. Detail of MCC compartment 2M (Westinghouse Size 4 FVNR controller).

Fig. A-10. Detail of MCC compartment 3B (Westinghouse Size 2 FVNR controller).

Fig. A-11. Detail of MCC compartment 3D (General Electric Type CR relay, Cutler-Hammer Powerreed relay, Square-D Type KP relay).

Fig. A-12. Detail of MCC compartment 3G (Westinghouse Size 4 FVNR controller).

Fig. A-13. Detail of MCC compartment 3J (General Electric Type CR relays).

Fig. A-14. Detail of MCC compartment 3M (Westinghouse Size 2 FVR controller).

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Details of Controller and Relay Installation

A-1

h-a-2

APPENDIX A

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Fig. A-4. Detail of MCC compartment 1J (Westinghouse Type AR relay, Square-D Type KP relay).

Fig. A-5. Detail of MCC compartment 1M (Westinghouse Size 3 FVNR controller).

Fig. A-6. Detail of MCC compartment 2B (Westinghouse Type AR relay, Square-D Type X relay).

Fig. A-7. Detail of MCC compartment 2E (Westinghouse Size 2 FVR controller).

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Fig. A-9. Detail of MCC compartment 2M (Westinghouse Size 4 FVNR controller).

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Fig. A-12. Detail of MCC compartment 3G (Westinghouse Size 4 FVNR controller).

Fig. A-13. Detail of MCC compartment 3J (General Electric Type CR relays).

Fig. A-14. Detail of MCC compartment 3M (Westinghouse Size 2 FVR controller).

A P P E N D I X B

Resonance Search Transmissibility Plots

R U N 2

Four bolts per column with top brace, vertical direction

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 3/2
Operator GREIERMAN Engineer Rum Full Scale 100 0

RUN #2

TRANSMISSIBILITY

CUSTOMER L.H.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 4/2
Operator GREIERMAN Engineer Rmy Full Scale 100 Q
RUN 2

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 6/2
Operator GREIERMAN Engineer Rm Full Scale 100 Q
RUN #2

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 12/2
Operator GREIERMAN Engineer R.M. Full Scale 100 Q
RUN 2

W784T-82 QA Form Approval LA

R U N 3

Four bolts per column with top brace, S-S direction

CUSTOMER L.L.N.L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 3/1
Operator GREIERMAN Engineer Run Full Scale 100 Q
RUN 3

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 4/1
Operator GREIERMAN Engineer pm Full Scale 100 0
RUN 3

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 5/1
Operator GREIERMAN Engineer Rmn Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 7/1
Operator GREIERMAN Engineer pm Full Scale 100 g
RUN 3

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 8/1
Operator GREIERMAN Engineer Rm Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L.L.N. L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 9/1
Operator GREIERMAN Engineer Rm Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L. L. N. L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 10/1
Operator GRETERMAN Engineer Rm Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 11/1
Operator GREIFMAN Engineer Rm Full Scale 100 0
RUN 3

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L. L. N. L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 13/1
Operator GREERMAN Engineer RM Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 14/1
Operator GREIERMAN Engineer Run Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 15/1
Operator BREITERMAN Engineer Rmy Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 16/1
Operator GREIERMAN Engineer Rm Full Scale 100 Q
RUN 3

W784T-82 QA Form Approval LS

CUSTOMER L. L. N. L. Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 17/1
Operator GREIERMAN Engineer Rum Full Scale 100 g
RUN 3

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 18/1
Operator GRETERMAN Engineer Rm Full Scale 100 Q
RUN 3

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 9-25-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 19/1
Operator GRETERMAN Engineer Rmr Full Scale 100 Q
RUN 3

R U N 1 1

Four bolts per column with top brace, F-B direction

CUSTOMER L.L.N.L Job No. 26447 Date 10-2-85

Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 3/1

Operator GREIERMAN Engineer Bm Full Scale 100 0

Run # 11

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 4/1
Operator GRETERMAN Engineer Ruu Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 5/1
Operator GREIERMAN Engineer Rm Full Scale 100 0
Run # 11

CUSTOMER L. L. N. L. Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 7/1
Operator GREIFERMAN Engineer pm Full Scale 100 g
RUN # 11

CUSTOMER L. L. N. L. Job No 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 8/1
Operator GREIERMAN Engineer *pm* Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 9/1
Operator GREIERMAN Engineer Bnn Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 10/1
Operator GREIERMAN Engineer Bm Full Scale 100 0
Run # 11

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 11/1
Operator GREIERMAN Engineer Bm Full Scale 100 0
Run # 11

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 13/1
Operator GREIERMAN Engineer pm Full Scale 100 Q
RRV# 11

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 14/1
Operator GREIERMAN Engineer Bmy Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 15/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER L.L.N.L Job No 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 16/1
Operator GREIERMAN Engineer *[Signature]* Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 17/1
Operator GREIERMAN Engineer Bm Full Scale 100 Q
Run # 11

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L. Job No. 26447 Date 10-2-85
Specimen MOTOR CONTROL CENTER Test Axis X Accel. No. 18/1
Operator GREIERMAN Engineer Run Full Scale 100 Q
Run# 11

TRANSMISSIBILITY

W784T-82 QA Form Approval 24

CUSTOMER L.L.N.L. Job No. 26447 Date 10-2-85

Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 19/1

Operator GREEDMAN Engineer Ray Full Scale 100 Q
Run# 11

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

R U N 1 8

Four bolts per column with no top brace, S-S direction

CUSTOMER L.L.N.L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 3/1
Operator GREIFERMAN Engineer Run Full Scale 100 0
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 4/1
Operator GREIERMAN Engineer Rmy Full Scale 100 0
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 5/1
Operator GREIERMAN Engineer Rumy Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 7/1
Operator GREIFERMAN Engineer RMM Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel No 8/1
Operator GREIERMAN Engineer Rm Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 9/1
Operator GREIERMAN Engineer RMM Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel No 10/1
Operator GREIFERMAN Engineer Rm Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 11/1
Operator SPREIERMAN Engineer [Signature] Full Scale 100 0
RUN 18

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 13/1
Operator GREIERMAN Engineer R. M. Full Scale 100 0
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 14/1
Operator GREIERMAN Engineer Lmz Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 15/1
Operator GREIERMAN Engineer RMM Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 16/1
Operator GREIFERMAN Engineer Rm Full Scale 100 0
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 17/1
Operator GREIERMAN Engineer RUN Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel No. 18/1
Operator GREIERMAN Engineer [Signature] Full Scale 100
RUN 18

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Z Accel. No. 19/1
Operator GREIERMAN Engineer RW Full Scale 100 Q
RUN 18

TRANSMISSIBILITY

W784T-82 QA Form Approval 2/1

R U N 1 9

Four bolts per column with no top brace, vertical direction

CUSTOMER L.L.N.L Job No. 26447 Date 10-4-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 6/2
Operator GREIERMAN Engineer Wm Full Scale 100 0
RUN 19

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 12/2
Operator SPREIFERMAN Engineer RM Full Scale 100 Q
RUN 19

TRANSMISSIBILITY

R U N 2 6

Four bolts per column with no top brace, F-B direction

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 3/1
Operator GREIERMAN Engineer mu Full Scale 100 0
Run #26

TRANSMISSIBILITY

W784T-82 QA Form Approval LS

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 4/1
Operator GREIERMAN Engineer pmu Full Scale 100 Q
RUN#26

TRANSMISSIBILITY

W784T-92 QA Form Approval LA

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No 5/1
Operator GREIERMAN Engineer Bm Full Scale 100
Run #26

TRANSMISSIBILITY

CUSTOMER L. L. N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 7/1
Operator GRETERMAN Engineer RM Full Scale 100 Q
Run#26

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No. 8/1
Operator GRETERMAN Engineer Run Full Scale 100 0
Run #26

TRANSMISSIBILITY

W784T-82 QA Form Approval *LA*

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 9/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN #26

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER LLNL Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 10/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 0
Run# 26

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER C. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No. 11/1
Operator GRETERMAN Engineer Rm Full Scale 100 Q
RUN#26

TRANSMISSIBILITY

W784T-82 QA Form Approval 24

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 13/1
Operator GREIERMAN Engineer gmy Full Scale 100 Q
Run#26

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 14/1
Operator GRETERMAN Engineer Rm Full Scale 100 Q
RuW#26

TRANSMISSIBILITY

CUSTOMER L.I.N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 15/1
Operator GREIFMAN Engineer RM Full Scale 100 0
RUN# 26

TRANSMISSIBILITY

W784T-82 QA Form Approval LS

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 16/1
Operator GREIERMAN Engineer Jim Full Scale 100 Q
Run #26

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER E. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 17/1
Operator _____ Engineer Ray Full Scale 100 Q
Run #26

TRANSMISSIBILITY

CUSTOMER L. L. W. L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 18/1

Operator _____ Engineer Jim Full Scale 100 Q
Run #26

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 19/1
Operator _____ Engineer Rm Full Scale 100 Q
Run #26

TRANSMISSIBILITY

R U N 3 3

Two bolts per column with no top brace, S-S direction

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 3/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 0
RUN 33

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 4/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis 5/5 Accel. No. 5/1
Operator GREIERMAN Engineer Phm Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel No 7/1
Operator GREIERMAN Engineer Run Full Scale 100 Q
RUN 33

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 8/1
Operator GREIERMAN Engineer mm Full Scale 100 Q
RUN33

TRANSMISSIBILITY

W784T-82 QA Form Approval LS

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 9/1
Operator BREITERMAN Engineer [Signature] Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 10/1
Operator GRETERMAN Engineer [Signature] Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 11/1
Operator GREIERMAN Engineer Bur Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel No 13/1
Operator BREIERMAN Engineer Bur Full Scale 100 g
RUN 33

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 14/1
Operator BRETERMAN Engineer *RM* Full Scale 100 g
RUN 33

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 15/1
Operator GRETERMAN Engineer [Signature] Full Scale 100 0
RUN 33

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 16/1
Operator GREIERMAN Engineer Run Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 17/1
Operator BREITERMAN Engineer Run Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 18/1
Operator GREIERMAN Engineer Bur Full Scale 100 Q
RUN 33

TRANSMISSIBILITY

CUSTOMER LLNL Job No. 26447 Date 12-3-85
Specimen MOTOR CONTROL UNIT Test Axis S/S Accel. No. 19/1
Operator GRETERMAN Engineer [Signature] Full Scale 100
RUN 33

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

R U N 3 4

Two bolts per column with no top brace, vertical direction

CUSTOMER L.L.N.L Job No. 26447 Date 12-4-85
Specimen MOTOR CONTROL CENTER Test Axis Y Accel. No. 6/2
Operator BREITERMAN Engineer [Signature] Full Scale 100 0
RW34

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER L.C.N.C. Job No. 26447 Date 12-4-85
Specimen MOTOR CONTROL CENTER Test Axis Y Accel. No. 12/2
Operator GREIERMAN Engineer Bm Full Scale 100 0
RUN 34

R U N 4 1

Two bolts per column with no top brace, F-B direction

CUSTOMER L.L.N.L Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 3/1
Operator GREIERMAN Engineer Bm Full Scale 100 0
RUN 41

TRANSMISSIBILITY

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 4/1
Operator GREIERMAN Engineer Bru Full Scale 100 Q
RUN 41

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No. 5/1
Operator GRETERMAN Engineer *PM* Full Scale 100 0
RUN 41

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 7/1
Operator BREITERMAN Engineer Bm Full Scale 100 0
RUN 41

TRANSMISSIBILITY

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 8/1
Operator GRETERMAN Engineer RW Full Scale 100 g
RUN 41

TRANSMISSIBILITY

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 9/1
Operator GRETERMAN Engineer [Signature] Full Scale 100 0
RUN 41

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 10/1
Operator BREIERMAN Engineer BM Full Scale 100 0
Run 41

TRANSMISSIBILITY

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 11/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RVN 41-

W784T-82 QA Form Approval [Signature]

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 13/1
Operator GRETERMAN Engineer PM Full Scale 100 Q
RUN 41

W784T-82 QA Form Approval LA

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No 14/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN 41

CUSTOMER L.I.N.L Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 15/1
Operator BRETERMAN Engineer *pm* Full Scale 100 0
RUN 41

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 16/1
Operator BRETERMAN Engineer Bm Full Scale 100 Q
RUN 41

TRANSMISSIBILITY

CUSTOMER LENL Job No. 26447 Date 12-5-85
 Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 17/1
 Operator GRETERMAN Engineer Bm Full Scale 100 Q
RUN 41

TRANSMISSIBILITY

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No 18/1
Operator GREIERMAN Engineer *DM* Full Scale 100
RUN 41

TRANSMISSIBILITY

W784T-82 QA Form Approval *LA*

CUSTOMER LLNL Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 19/1
Operator BREITERMAN Engineer Bru Full Scale 100 Q
RUN 41

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

R U N 4 7

Four bolts per column with internal bracing, F-B direction

CUSTOMER LLNL Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 3/1
Operator GRETERMAN Engineer Rm Full Scale 100 Q
RUN 47

CUSTOMER L.L.N.L. Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 4/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN 97

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER LLNL Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No. 5/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 g
RUN 87

CUSTOMER LLNL Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 7/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 0
RUN 47

CUSTOMER L.L.N.L Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 8/1
Operator GREIERMAN Engineer *[Signature]* Full Scale 100 0
RUN47

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 9/1
Operator GRETERMAN Engineer Full Scale 100 Q
RUN 47

CUSTOMER L.L.N.L. Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No. 10/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN 47

TRANSMISSIBILITY

CUSTOMER L. L. N. L. Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 11/1
Operator BREITERMAN Engineer *[Signature]* Full Scale 100 Q
RUN 47

TRANSMISSIBILITY

W784T-82 QA Form Approval *[Signature]*

CUSTOMER LLNL Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 13/1
Operator GRETERMAN Engineer [Signature] Full Scale 100 Q
RUN 47

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 14/1
Operator GREIERMAN Engineer pm - Full Scale 100 Q
RUN 47

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 15/1
Operator GREIERMAN Engineer pm Full Scale 100 RUN 47

TRANSMISSIBILITY

W784T-82 QA Form Approval SA

CUSTOMER L.L.N.L Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 16/1
Operator BREIERMAN Engineer *Bm* Full Scale 100 Q
RUN 47

TRANSMISSIBILITY

CUSTOMER L.L.N. L Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 17/1
Operator GREIERMAN Engineer Bm Full Scale 100 0
RUN 47

CUSTOMER L.L.N.L Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No 18/1
Operator GREIERMAN Engineer BM Full Scale 100 0
RUN 47

CUSTOMER L. L. N. L. Job No. 26447 Date 12-6-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 19/1
Operator GREIERMAN Engineer pm Full Scale 100 0
RUN 47

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

R U N 5 0

Four bolts per column with internal bracing, F-B direction

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 3/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 0
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER L.L.N.L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 4/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 5/1
Operator GREIERMAN Engineer fm Full Scale 100 0
RUN 50

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 7/1
Operator GREIFMAN Engineer *[Signature]* Full Scale 100 g
RUN 50

TRANSMISSIBILITY

CUSTOMER L.L.N.L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis _____ Accel. No. 8/1
Operator BRETERMAN Engineer GMW Full Scale 100 0
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 9/1
Operator GREIERMAN Engineer Bm Full Scale 100 0
RUN 50

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 10/1
Operator GREIERMAN Engineer *pm* Full Scale 100 0
RUN 50

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No 11/1
Operator GRETERMAN Engineer [Signature] Full Scale 100 Q
RUN 50

CUSTOMER L.L.N.L Job No 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel No 13/1
Operator GRETERMAN Engineer Am Full Scale 100 Q
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 14/1
Operator GREIERMAN Engineer Am Full Scale 100 0
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 15/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 0
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

CUSTOMER L.L.N.L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 16/1
Operator BREIERMAN Engineer [Signature] Full Scale 100 0
RUN 50

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 17/1
Operator GRETERMAN Engineer Bm Full Scale 100 Q
RUN 50

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 18/1
Operator GREIERMAN Engineer [Signature] Full Scale 100 0
RUN 50

TRANSMISSIBILITY

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis X Accel. No. 19/1
Operator GREIERMAN Engineer Am Full Scale 100 0
RUN 50

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

R U N 5 1

Four bolts per column with internal bracing, vertical direction

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel No. 12/2
Operator GREIERMAN Engineer pm Full Scale 100 Q
RVN 51

TRANSMISSIBILITY

W784T-82 QA Form Approval LA

CUSTOMER L.L.N.L Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Test Axis Y Accel. No. 6/2
Operator GREIERMAN Engineer [Signature] Full Scale 100 Q
RUN 51

TRANSMISSIBILITY

W784T-82 QA Form Approval [Signature]

A P P E N D I X C

Time-History Data from Runs 17, 31, 46, and 56

APPENDIX C

This appendix presents chatter detector output and time-history plots from Runs 17, 31, 46, and 56 showing contact chatter, times of occurrence, and the corresponding in-cabinet excitation waveform for each device. In these tests, the MCC was subjected to the most severe input motion applied to each mounting configuration with horizontal table input (in each case oriented in the F-B cabinet direction) ranging from 2.1 to 2.5g ZPA. Figure C-1 provides annotated sample plots and a legend to aid in their interpretation.

Equivalent time-history information for all runs is included in the final test report submitted to LLNL by Wyle Laboratories.*

*Wyle Laboratories, Scientific Services and Systems Group, Seismic Fragility Evaluation of a Motor Control Center for Lawrence Livermore National Laboratory (May 1986).

X-Y Axis = Front-to-Back/Vertical
 Z-Y Axis = Side-to-Side/Vertical

OFF-ON FW = De-energized - energized sequence, FW starter active
 ON-OFF RV = Energized - de-energized sequence, RV starter active

Third column indicates the beginning and end of time period over which chatter (or bouncing) occurred.

Channel ID

1st 2 digits = position in MCC

NO		normally open auxilliary contact
NC	Starter	normally closed auxilliary contact
AMPS		main contact

FW NO		NO forward auxilliary contact
FW NC		NC forward auxilliary contact
RV NO	Starter	NO reverse auxilliary contact
RV NC		NO reverse auxilliary contact
AMPS		Main contact of active starter

W = Westinghouse Relay
 GE = General Electric Relay
 X = Square D Type X Relay
 KP = Square D Type KP Relay
 CH = Cutler-Hammer Relay

RL-OFF = Off-table relay connected to relay
 ST-OFF = Off-table relay connected to starter

ST-ST-CH = Starters state change command
 RL-ST-CH = Relays state change command

Number of chatter failures per time length

This indicates the number of chatters as a function of the duration of each individual chatter.

The last column shows the total number of chatters and bounces.

Fig. C-1. Legend for chatter detector output and time-history plots.

Fig. C-1 (cont.). Legend for chatter detector output and time-history plots.

Fig. C-1 (cont.). Legend for chatter detector output and time-history plots.

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL CENTER Axis of Test X-Y

Accel. No. 1 Axis HORIZ Control (☒) Response () OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 17

Operator GREIFMAN Engineer pm 5^B LEVEL 30Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL CENTER Axis of Test X-Y

Accel. No. 2 Axis VERT Control (LT) Response () OBE () SSE () DBE ()

Full Scale 100 g Damping 51.3 % Run No. 17

Operator GREIFMAN Engineer Om 5th LEVEL 3042

RESPONSE SPECTRUM

2-10-85-ss
- Form Approval 24

R U N 1 7

Four bolts per column with top brace, 2.1g table ZPA

START TIME= 0.0000

STOP TIME= 25.670

TEST NAME=LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW
 TEST DATE=10/03/85 10:16:42 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
1C-NO	2			1	NO CHATTER						
1C-NC	3			1	NO CHATTER						
1C-AMPS	4			1	NO CHATTER						
2B-W.NO	6			1	NO CHATTER						
2B-W.NC	7	12.974	12.980	1	0	1	0	0	0	0	1
2B-X.NO	8			1	NO CHATTER						
2B-X.NC	10	7.698	12.985	1	0	2	3	0	0	0	5
1G-NO	11			1	NO CHATTER						
1G-NC	12	7.693	10.687	1	1	0	2	0	0	0	3
1G-AMPS	13			1	NO CHATTER						
1J-W.NO	14			1	NO CHATTER						
1J-W.NC	15			1	NO CHATTER						
1J-KP.NO	16			1	NO CHATTER						
1J-KP.NC	17			1	NO CHATTER						
1M-NO	18			1	NO CHATTER						
1M-NC	19			1	NO CHATTER						
1M-AMPS	20			1	NO CHATTER						
2E-FW.NO	21	6.972	23.124	1	4	0	0	0	1	7	12
2E-FW.NC	22	5.541	23.467	1	4	6	32	8	26	26	102
2E-RV.NO	23			0	NO CHATTER						
2E-RV.NC	24	5.545	23.120	1	2	11	11	2	1	24	51
2E-AMPS	25			0	NO CHATTER						
2J-W.NO	26	7.697	14.396	1	3	3	0	0	0	0	6
2J-W.NC	27	7.698	14.397	1	1	3	0	0	0	0	4
2J-GE.NO	28	9.251	9.256	1	1	0	0	0	0	0	1
2J-GE.NC	29	7.541	14.345	1	3	2	5	0	0	0	10
2J-KP.NO	30			1	NO CHATTER						
2J-KP.NC	31	6.994	14.239	1	2	0	0	0	0	0	
2J-X.NO	32	6.969	14.384	1	3	11	9	0	0	0	
2J-X.NC	33	5.538	14.491	1	0	3	26	9	0	0	
2J-CH.NO	34			1	NO CHATTER						
2J-CH.NC	35			1	NO CHATTER						
2M-NO	36			1	NO CHATTER						
2M-NC	38	7.688	14.379	1	2	0	4	0	0	0	
2M-AMPS	39			1	NO CHATTER						
3B-NO	40	14.756	14.761	1	1	0	0	0	0	0	
3B-NC	42	7.504	14.405	1	3	3	4	1	0	0	
3B-AMPS	43	18.328	18.345	1	0	0	1	0	0	0	
3D-GE.NO	44			1	NO CHATTER						

TEST NAME=LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW
 TEST DATE=10/03/85 10:16:42 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
3D-GE.NC	45	7.738	13.034	1	0	1	2	0	0	0	3
3D-CH.NO	46			1	NO CHATTER						
3D-CH.NC	47			1	NO CHATTER						
3D-KP.NO	48			1	NO CHATTER						
3D-KP.NC	49			1	NO CHATTER						
3G-NO	50	7.699	12.992	1	0	3	1	0	0	0	4
3G-NC	51	6.975	14.406	1	2	1	5	3	0	0	11
3G-AMPS	52	7.702	13.028	1	0	0	0	0	2	0	2
3J-GE1NO	53			1	NO CHATTER						
3J-GE1NC	54	7.741	12.182	1	0	0	2	1	0	0	3
3J-GE2NO	55			1	NO CHATTER						
3J-GE2NC	56	7.740	12.178	1	0	0	2	1	0	0	3
3M-FW.NO	57			1	NO CHATTER						
3M-FW.NC	58	6.889	14.387	1	4	11	3	0	0	0	18
3M-RV.NO	59			0	NO CHATTER						
3M-RV.NC	60	6.973	14.394	0	5	7	2	0	0	0	14
3M-AMPS	61			1	NO CHATTER						
ST-ST-CH	62				STATE SW. #	2	CHANGE AT	14.726			
RL-ST-CH	63				STATE SW. #	1	CHANGE AT	14.752			
TOTAL=											335

ACC-8 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 1 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-10 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 2 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-14 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 3 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

1J-KP.NC TIME HISTORY SEC $\times 10$
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 4 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-18 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 5 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-11 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 6 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-15 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 7 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-15 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 8 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW,

ACC-15 NO FILTER, 1000.00 SPS, SEC x 10
 DATE 10/03/85 DISPLAY NUMBER 9 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

2M-AMPS TIME HISTORY SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 10 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-9 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 11 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FU

ACC-13 ACCELERATION SEC $\times 10$
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 12 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-13 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 13 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-16 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 14 .00 TO 25.67 SEC
 LLML 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-17 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 15 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-19 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 16 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 17 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FU

ACC-4 NO FILTER, 1000.00 SPS, SEC x 10
 DATE 10/03/85 DISPLAY NUMBER 18 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-7

ACCELERATION

SEC x 10

NO FILTER, 1000.00 SPS,

DATE 10/03/85 DISPLAY NUMBER 19 .00 TO 25.67 SEC
LLML 26447 RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FW

ACC-12 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/03/85 DISPLAY NUMBER 20 .00 TO 25.67 SEC
 LLNL 26447, RUN 17, X-Y AXIS, 5TH LEVEL/BOOKEND, OFF-ON FU

CUSTOMER L.L.W.L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 5 Axis X Control () Response (T) OBE () SSE () DBE ()
Full Scale 100 g Damping 5.1, 3 % Run No. 17
Operator GREIFERMAN Engineer [Signature] 5^B Level 3042

RESPONSE SPECTRUM

CUSTOMER L-L.N. L Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 8 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 %

Run No. 17

Operator GREIFMAN Engineer DM

5th LEVEL

3042

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 9 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 4, 3 %

Run No. 17

Operator GREIFMAN Engineer Om

5th Level 3042

RESPONSE SPECTRUM

CUSTOMER L.L.N.C. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 10 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 17
Operator GREIERMAN Engineer GM 5th LEVEL 30 Hz
RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 11 Axis X Control () Response (/) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 %

Run No. 17

Operator GREIFMAN Engineer PM

5th LEVEL

3042

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 12 Axis Y Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 17
Operator GREIFMAN Engineer Qm 5th LEVEL 3042

RESPONSE SPECTRUM

CUSTOMER L.L.N.L Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 13 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5.1, 3 %

Run No. 17

Operator GREIERMAN Engineer DM

#5TH LEVEL 3042

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL Axis of Test X-Y

Accel. No. 17 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 17

Operator GREIERMAN Engineer On 5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-3-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 17 Axis X Control () Response () OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 17

Operator SEE TERNAN Engineer AM 5th LEVEL 3042

RESPONSE SPECTRUM

CUSTOMER LLN-L. Job No. 26447 Date 10-3-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 18 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5.1, 3 % Run No. 17
Operator GRETERMAN Engineer PM 5th LEVEL 3042

RESPONSE SPECTRUM

R U N 3 1

Four bolts per column with no top brace, 2.2g table ZPA

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL CENTER Axis of Test X-Y

Accel. No. 1 Axis HORIZ Control (☒) Response () OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GREIFMAN Engineer [Signature]

4B LEVEL 30M2

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL CENTER Axis of Test X-Y
Accel. No. 2 Axis VERT Control (✓) Response () OBE () SSE () DBE ()
Full Scale 100 g Damping 51.3 % Run No. 31
Operator GREIFMAN Engineer AM 4th LEVEL 30 Hz

RESPONSE SPECTRUM

START TIME= 0.0000

STOP TIME= 26.860

TEST NAME=LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,
 TEST DATE=10/25/85 15:23: 3 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
1C-NO	2	20.257	22.956	1	0	0	3	0	0	0	3
1C-NC	3	17.612	23.815	1	0	0	1	4	0	0	5
1C-AMPS	4	20.259	22.978	1	0	0	2	1	0	0	3
2B-W.NO	6	20.226	23.779	1	2	1	1	0	0	0	4
2B-W.NC	7	17.592	23.781	1	2	2	2	0	0	0	6
2B-X.NO	8	20.233	22.930	1	0	1	1	0	0	0	2
2B-X.NC	10	17.376	23.789	1	1	2	3	4	0	0	10
1G-NO	11			1	NO CHATTER						
1G-NC	12	20.259	22.730	1	1	0	0	1	0	0	2
1G-AMPS	13			1	NO CHATTER						
1J-W.NO	14			1	NO CHATTER						
1J-W.NC	15			1	NO CHATTER						
1J-KP.NO	16			1	NO CHATTER						
1J-KP.NC	17			1	NO CHATTER						
1M-NO	18			1	NO CHATTER						
1M-NC	19			1	NO CHATTER						
1M-AMPS	20			1	NO CHATTER						
2E-FW.NO	21			0	NO CHATTER						
2E-FW.NC	22	15.738	23.768	1	0	0	0	0	1	10	11
2E-RV.NO	23			1	NO CHATTER						
2E-RV.NC	24	18.504	23.775	1	0	2	3	1	0	0	6
2E-AMPS	25			1	NO CHATTER						
2J-W.NO	26			1	NO CHATTER						
2J-W.NC	27			1	NO CHATTER						
2J-GE.NO	28			1	NO CHATTER						
2J-GE.NC	29			1	NO CHATTER						
2J-KP.NO	30			1	NO CHATTER						
2J-KP.NC	31			1	NO CHATTER						
2J-X.NO	32			1	NO CHATTER						
2J-X.NC	33	17.566	23.757	1	1	2	2	0	0	0	
2J-CH.NO	34			1	NO CHATTER						
2J-CH.NC	35			1	NO CHATTER						
2M-NO	36			1	NO CHATTER						
2M-NC	38			1	NO CHATTER						
2M-AMPS	39			1	NO CHATTER						
3B-NO	40	22.927	22.929	1	1	0	0	0	0	0	
3B-NC	42	20.229	22.938	1	0	0	1	2	0	0	
3B-AMPS	43			1	NO CHATTER						
3D-GE.NO	44			1	NO CHATTER						

TEST NAME=LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,
 TEST DATE=10/25/85 15:23: 3 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
3D-GE.NC	45			1	NO CHATTER						
3D-CH.NO	46			1	NO CHATTER						
3D-CH.NC	47			1	NO CHATTER						
3D-KP.NO	48			1	NO CHATTER						
3D-KP.NC	49	15.684	15.727	1	3	0	0	0	0	0	3
3G-NO	50			1	NO CHATTER						
3G-NC	51			1	NO CHATTER						
3G-AMPS	52			1	NO CHATTER						
3J-GE1NO	53			1	NO CHATTER						
3J-GE1NC	54			1	NO CHATTER						
3J-GE2NO	55			1	NO CHATTER						
3J-GE2NC	56			1	NO CHATTER						
3M-FW.NO	57			0	NO CHATTER						
3M-FW.NC	58	15.714	22.898	1	0	0	0	0	1	5	6
3M-RV.NO	59			1	NO CHATTER						
3M-RV.NC	60	15.711	20.012	1	1	1	0	0	0	0	2
3M-AMPS	61			1	NO CHATTER						
ST-ST-CH	62				STATE SW. #	2	CHANGE AT	15.634			
RL-ST-CH	63				STATE SW. #	1	CHANGE AT	15.679			
TOTAL =											72

ACC-8 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 1 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 2 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-14 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 3 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-3 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 4 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-18 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 5 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-11 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 6 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-15 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 7 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-15 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 8 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-15 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 9 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-4 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 10 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-9 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 11 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-13 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 12 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-13 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 13 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-16 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 14 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-17 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 15 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-19 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 16 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 17 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

NO FILTER, 1000.00 SPS,
 DATE 10/25/85 DISPLAY NUMBER 18 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

ACC-12 NO FILTER, 1000.00 SPS, SEC x 10
 DATE 10/25/85 DISPLAY NUMBER 19 .00 TO 26.86 SEC
 LLNL 26447, RUN 31, X-Y AXIS, 4TH LEVEL/12 BOLTS, ON-OFF RV,

CUSTOMER L.L.N.L. Job No 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel No 3 Axis X Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 4, 3 % Run No 31
Operator SPETERMAN Engineer DM 4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 4 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GREIERMAN Engineer AM 4B LEVEL 3042

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 5 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GREIFERMAN Engineer OML 4B LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 8 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GRETERMAN Engineer DM

4B LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.C.N.C. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 9 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GRETERMAN Engineer PM 4B Level 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 10 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GREIERMAN Engineer Ch 4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26477 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 11 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 %

Run No. 31

Operator GREIFMAN Engineer DM

4B LEVEL 3042

RESPONSE SPECTRUM

CUSTOMER L.C.N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 12 Axis Y Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 31
Operator GREIERMAN Engineer DM 4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.C. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 13 Axis X Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 31
Operator BEETEMAN Engineer Am 4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 17 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5.1, 3 %

Run No. 31
4th LEVEL 30 Hz

Operator SPERMAN Engineer [Signature]

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 15 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5.13 % Run No. 31

Operator GREERMAN Engineer PM

4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. W. L. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 16 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator EXETERMAN Engineer [Signature] 4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. C. Job No. 26447 Date 10-25-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 17 Axis X Control () Response (X) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 31

Operator GREIFMAN Engineer AM 4th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.C.N.L. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 18 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 31
Operator SEEGERMAN Engineer Ben 4B Level 30Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.C. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 17 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 31
Operator GREILMAN Engineer ma 4B LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.C. Job No. 26447 Date 10-25-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 19 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 31
Operator GREILMAN Engineer pm 4th LEVEL 30 Hz

RESPONSE SPECTRUM

R U N 4 6

Two bolts per column with no top brace, 2.5g table ZPA

R U N 4 6

Two bolts per column with no top brace, 2.5g table ZPA

CUSTOMER L. L. N. L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL CENTER Axis of Test X-Y
Accel. No. 1 Axis HORIZ Control (☒) Response () OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator GREIERMAN Engineer On 5th LEVEL 3042
RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL CENTER Axis of Test X-Y
Accel No 2 Axis VERT Control (✓) Response () OBE () SSE () DBE ()
Full Scale 100 g Damping 5.13 % Run No. 46
Operator GREIFMAN Engineer Am 5th LEVEL 30Hz

RESPONSE SPECTRUM

START TIME= 0.0000

STOP TIME= 26.980

TEST NAME=LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/6 BOLTS, OFF-ON FW
 TEST DATE=12/05/85 16: 9:46 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
1C-NO	2	7.194	14.387	3	1	0	0	0	0	0	1
1C-NC	3	7.991	10.557	3	0	0	1	1	0	0	2
1C-AMPS	4			3	NO CHATTER						
2B-W.NO	6	8.807	14.381	3	1	1	0	0	0	0	2
2B-W.NC	7	8.032	12.018	3	0	2	1	2	0	0	5
2B-X.NO	8	8.804	8.818	3	0	0	1	0	0	0	1
2B-X.NC	10	8.144	12.022	3	0	0	2	4	0	0	6
1G-NO	11			2	NO CHATTER						
1G-NC	12			3	NO CHATTER						
1G-AMPS	13			3	NO CHATTER						
1J-W.NO	14			3	NO CHATTER						
1J-W.NC	15			3	NO CHATTER						
1J-KP.NO	16			3	NO CHATTER						
1J-KP.NC	17			3	NO CHATTER						
1M-NO	18			3	NO CHATTER						
1M-NC	19			3	NO CHATTER						
1M-AMPS	20			3	NO CHATTER						
2E-FW.NO	21			3	NO CHATTER						
2E-FW.NC	22	8.533	12.016	3	0	2	7	0	0	0	9
2E-RV.NO	23			0	NO CHATTER						
2E-RV.NC	24	8.813	12.007	1	0	0	0	0	2	5	7
2E-AMPS	25			3	NO CHATTER						
2J-W.NO	26	14.380	14.382	3	1	0	0	0	0	0	1
2J-W.NC	27			3	NO CHATTER						
2J-GE.NO	28			3	NO CHATTER						
2J-GE.NC	29	8.697	8.707	3	0	1	0	0	0	0	1
2J-KP.NO	30			3	NO CHATTER						
2J-KP.NC	31			3	NO CHATTER						
2J-X.NO	32			3	NO CHATTER						
2J-X.NC	33			3	NO CHATTER						
2J-CH.NO	34			3	NO CHATTER						
2J-CH.NC	35			3	NO CHATTER						
2M-NO	36			2	NO CHATTER						
2M-NC	38	7.982	7.992	2	1	0	0	0	0	0	1
2M-AMPS	39	7.980	14.389	1	0	0	0	0	0	0	1
3B-NO	40	8.810	8.816	3	0	1	0	0	0	0	1
3B-NC	42	8.802	10.551	3	0	0	0	0	0	0	0
3B-AMPS	43			3	NO CHATTER						
3D-GE.NO	44			3	NO CHATTER						

WYLE LABORATORIES, NORCO, CA. FACILITY

CHATTER AND PULSE ANALYSIS PROGRAM

12/05/85 16:15:56 HOURS

PAGE 2

TEST NAME=LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/6 BOLTS, OFF-ON FW
 TEST DATE=12/05/85 16: 9:46 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
3D-GE.NC	45			3	NO CHATTER						
3D-CH.NO	46			3	NO CHATTER						
3D-CH.NC	47			3	NO CHATTER						
3D-KP.NO	48			3	NO CHATTER						
3D-KP.NC	49			3	NO CHATTER						
3G-NO	50			2	NO CHATTER						
3G-NC	51			3	NO CHATTER						
3G-AMPS	52	7.980	14.389	1	0	0	0	0	0	1	1
3J-GE1NO	53			3	NO CHATTER						
3J-GE1NC	54			3	NO CHATTER						
3J-GE2NO	55			3	NO CHATTER						
3J-GE2NC	56			3	NO CHATTER						
3M-FW.NO	57			3	NO CHATTER						
3M-FW.NC	58	6.417	14.272	3	4	5	5	0	0	0	14
3M-RV.NO	59			0	NO CHATTER						
3M-RV.NC	60	11.208	13.772	1	0	0	0	0	0	2	2
3M-AMPS	61			3	NO CHATTER						
ST-ST-CH	62			3	STATE SW. # 2 FIRST CHANGE AT 7.1700 LAST CHANGE AT 14.359						
RL-ST-CH	63			3	STATE SW. # 1 FIRST CHANGE AT 7.1570 LAST CHANGE AT 14.366						
RL-OFF	92			3	NO CHATTER						
ST-OFF	94			3	NO CHATTER						
TOTAL=										57

ACC-8 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 1 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-10 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/05/85 DISPLAY NUMBER 2 .00 TO 26.98 SEC

LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-14 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/05/85 DISPLAY NUMBER 3 .00 TO 26.98 SEC

LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-3 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 4 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-18 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 5 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FU

ACC-11 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 6 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-15 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 7 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-15 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 8 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FU

ACC-15 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 9 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FU

ACC-4 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 10 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-9 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/05/85 DISPLAY NUMBER 11 .00 TO 26.98 SEC

LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FU

ACC-13 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 12 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-13 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 13 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-16 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 14 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-17 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 15 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

ACC-19 ACCELERATION SEC x 10^1
 NO FILTER, 1000.00 SPS,
 DATE 12/05/85 DISPLAY NUMBER 16 .00 TO 26.98 SEC
 LLNL 26447, RUN 46, X-Y AXIS, 5TH LEVEL/ 6 BOLTS, OFF-ON FW

CUSTOMER L.L.N.C. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 3 Axis X Control () Response () OBE () SSE () DBE ()
Full Scale 100 g Damping 5.1.3 % Run No. 46
Operator SEIFERMAN Engineer PA 5th LEVEL 30Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 4 Axis X Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator GREENMAN Engineer PM 5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 5 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 0 Damping 5, 1, 3 % Run No. 46
Operator [Signature] Engineer [Signature] 5th Level 30Hz Lo-Pass

RESPONSE SPECTRUM

CUSTOMER L. L. N. C. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 8 Axis X Control () Response (X) OBE () SSE () DBE ()
Full Scale 100 g Damping 5.13 % Run No. 46
Operator SPETTERMAN Engineer [Signature] 5th Level 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. C. Job No. 26447 Date 12-5-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 9 Axis Y Control () Response (X) OBE () SSE () DBE ()

Full Scale 100 g Damping 5.13 % Run No. 46

Operator SCHEERMAN Engineer [Signature] 5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 10 Axis Y Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator GREIERMAN Engineer AM 5th LEVEL 3042

RESPONSE SPECTRUM

CUSTOMER L-L.N.L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 11 Axis X Control () Response (☒) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator DEETERMAN Engineer AM 5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 13 Axis Y Control () Response (X) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator GREIFMAN Engineer DM 5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 14 Axis X Control () Response (X) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator GREEDMAN Engineer PM 5th LEVEL 30112

RESPONSE SPECTRUM

CUSTOMER L.L.N.C. Job No. 26447 Date 12-5-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 15 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 46
Operator GREIERMAN Engineer PM 5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L.L.N.C. Job No. 26447 Date 12-5-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 16 Axis X Control () Response (X) OBE () SSE () DBE ()

Full Scale 100 g Damping 5.1, 3 % Run No. 46

Operator GREIERMAN Engineer Om 5^B LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-5-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 17 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5.43 %

Run No 46

Operator GRETERMAN Engineer Om

5th LEVEL 30 Hz

RESPONSE SPECTRUM

CUSTOMER L. L. N. L.

Job No. 26447

Date 12-5-85

Specimen MOTOR CONTROL UNIT

Axis of Test X-Y

Accel. No. 18

Axis

x

Control ()

Response (✓)

OBE (

SSE (

DBE ()

Full Scale 100

Damping

5,13 %

Run No. 46

Operator GREIERMAN

Engineer

John

5B

5^B GUT

30/12

RESPONSE SPECTRUM

CUSTOMER L.L.N.L. Job No. 26447 Date 12-5-85
 Specimen MOTOR CONTROL UNIT Axis of Test X-Y
 Accel. No. 19 Axis X Control () Response (☒) OBE () SSE () DBE ()
 Full Scale 100 g Damping 5, 1.3 % Run No. 46
 Operator SPERMAN Engineer [Signature] 5B LEVEL 30 Hz

RESPONSE SPECTRUM

R U N 5 6

Four bolts per column with internal bracing, 2.2g table ZPA

R U N 5 6

Four bolts per column with internal bracing, 2.2g table ZPA

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL CENTER Axis of Test X-Y
Accel. No. 1 Axis HORIZ Control (☒) Response () OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 56
Operator GREIFERMAN Engineer pm 5TH LEVEL

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL CENTER Axis of Test X-Y
Accel. No. 2 Axis VERT Control (LT) Response () OBE () SSE () DBE ()
Full Scale 100 g Damping 51.3 % Run No. 56
Operator GREIFMAN Engineer Am 5th LEVEL 30Hz

RESPONSE SPECTRUM

START TIME= 0.0000

STOP TIME= 26.341

TEST NAME=LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV
 TEST DATE=12/11/85 16:17:52 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
1C-NO	2	14.229	22.164	1	0	0	0	0	0	2	2
1C-NC	3	19.482	22.184	1	1	0	0	3	0	0	4
1C-AMPS	4			0	NO CHATTER						2
2B-W.NO	6	21.942	21.954	1	0	0	1	0	0	0	1
2B-W.NC	7	14.250	22.167	1	0	1	1	1	0	0	3
2B-X.NO	8	21.949	22.151	1	1	1	0	0	0	0	2
2B-X.NC	10	19.460	23.007	1	2	1	0	3	0	0	6
1G-NO	11			0	NO CHATTER						
1G-NC	12	19.481	21.956	1	0	1	0	1	0	0	2
1G-AMPS	13			0	NO CHATTER						
1J-W.NO	14			1	NO CHATTER						
1J-W.NC	15			1	NO CHATTER						
1J-KP.NO	16			1	NO CHATTER						
1J-KP.NC	17			1	NO CHATTER						
1M-NO	18			1	NO CHATTER						
1M-NC	19			1	NO CHATTER						
1M-AMPS	20			1	NO CHATTER						
2E-FW.NO	21			0	NO CHATTER						
2E-FW.NC	22	14.277	22.131	1	0	0	0	0	1	2	3
2E-RV.NO	23			1	NO CHATTER						
2E-RV.NC	24	14.324	23.012	1	0	7	3	1	0	0	11
2E-AMPS	25			0	NO CHATTER						
2J-W.NO	26			1	NO CHATTER						
2J-W.NC	27			1	NO CHATTER						
2J-GE.NO	28			1	NO CHATTER						
2J-GE.NC	29	22.048	22.059	1	0	0	1	0	0	0	1
2J-KP.NO	30			1	NO CHATTER						
2J-KP.NC	31			1	NO CHATTER						
2J-X.NO	32			1	NO CHATTER						
2J-X.NC	33	19.491	22.132	1	0	0	1	0	0	0	1
2J-CH.NO	34			1	NO CHATTER						
2J-CH.NC	35			1	NO CHATTER						
2M-NO	36			1	NO CHATTER						
2M-NC	38			1	NO CHATTER						
2M-AMPS	39			0	NO CHATTER						
3B-NO	40	14.229	22.144	1	0	0	0	0	0	0	0
3B-NC	42	14.288	23.008	1	0	3	3	2	0	0	0
3B-AMPS	43			0	NO CHATTER						
3D-GE.NO	44			1	NO CHATTER						

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WYLE LABORATORIES, NORCO, CA. FACILITY

CHATTER AND PULSE ANALYSIS PROGRAM

12/16/85 09:05:56 HOURS

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TEST NAME=LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV
TEST DATE=12/11/85 16:17:52 HOURS

CHANNEL ID	CHANNEL NUMBER	FIRST CHATTER	LAST CHATTER	STATE CHANGE	NUMBER OF CHATTER FAILURES PER TIME LENGTH						TOTAL
					2.00-5.00	5.00-10.0	10.0-20.0	20.0-40.0	40.0-80.0	>80.0	
3D-GE.NC	45			1	NO CHATTER						
3D-CH.NO	46			1	NO CHATTER						
3D-CH.NC	47			1	NO CHATTER						
3D-KP.NO	48			1	NO CHATTER						
3D-KP.NC	49			1	NO CHATTER						
3G-NO	50			1	NO CHATTER						
3G-NC	51			1	NO CHATTER						
3G-AMPS	52			0	NO CHATTER						
3J-GE1NO	53			1	NO CHATTER						
3J-GE1NC	54			1	NO CHATTER						
3J-GE2NO	55			1	NO CHATTER						
3J-GE2NC	56			1	NO CHATTER						
3M-FW.NO	57			0	NO CHATTER						
3M-FW.NC	58	14.326	22.534	1	1	0	0	0	3	14	18
3M-RV.NO	59			1	NO CHATTER						
3M-RV.NC	60	19.223	21.697	1	1	2	1	0	0	0	4
3M-AMPS	61			1	NO CHATTER						
ST-ST-CH	62			1	STATE SW. #	2	CHANGE AT	14.229			
RL-ST-CH	63			1	STATE SW. #	1	CHANGE AT	14.226			
RL-OFF	92			1	NO CHATTER						
ST-OFF	94			1	NO CHATTER						
TOTAL=										68	

Report No. 26448
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ACC-8 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 1 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-10 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/11/85 DISPLAY NUMBER 2 .00 TO 26.34 SEC

LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-14 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/11/85 DISPLAY NUMBER 3 .00 TO 26.34 SEC

LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RU

ACC-3 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 4 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-18 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 5 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RU

ACC-11 ACCELERATION SEC x 10¹
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 6 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-15 ACCELERATION SEC $\times 10$
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 7 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RU

ACC-15 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 8 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-15 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/11/85 DISPLAY NUMBER 9 .00 TO 26.34 SEC

LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RU

ACC-4 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/11/85 DISPLAY NUMBER 10 .00 TO 26.34 SEC

LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB. MOD, ON-OFF RV

ACC-9 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 11 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB. MOD, ON-OFF RV

ACC-13 ACCELERATION SEC x 10
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 13 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-16 ACCELERATION SEC $\times 10$
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 14 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

ACC-17 ACCELERATION SEC $\times 10^1$
 NO FILTER, 1000.00 SPS,
 DATE 12/11/85 DISPLAY NUMBER 15 .00 TO 26.34 SEC
 LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB. MOD, ON-OFF RV

ACC-19 ACCELERATION SEC x 10¹

NO FILTER, 1000.00 SPS,

DATE 12/11/85 DISPLAY NUMBER 16 .00 TO 26.34 SEC

LLNL 26447, RUN 56, X-Y, 5TH LEVEL/12 BOLTS/CAB.MOD, ON-OFF RV

A P P E N D I X D

Response Spectra from Runs 17, 31, 46, and 56

APPENDIX D

This appendix presents test response spectra from Runs 17, 31, 46, and 56 showing local in-cabinet response at the location of each device and at the cabinet base. In these tests, the MCC was subjected to the most severe input motion applied to each mounting configuration with horizontal table input (in each case oriented in the F-B cabinet direction) ranging from 2.1 to 2.5g ZPA. Equivalent information for all runs is included in the final test report submitted to LLNL by Wyle Laboratories.*

*Wyle Laboratories, Scientific Services and Systems Group, Seismic Fragility Evaluation of a Motor Control Center for Lawrence Livermore National Laboratory (May 1986).

R U N 1 7

Four bolts per column with top brace, 2.1g table ZPA

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 8 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature] 5TH LEVEL 30Hz Lo-Pass

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel No 9 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 %

Run No. 56

Operator [Signature] Engineer [Signature]

5th LEVEL 30Hz Lo-Pass

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 10 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature] 5th LEVEL 30HZ Lo-PASS

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 11 Axis X Control () Response (☒) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature] 5" LEVEL 30HZ LO-PASS

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 14 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature] 5th LEVEL 30HZ Lo-PASS

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 15 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature] 5TH LEVEL 30HZ Lo-Pass

RESPONSE SPECTRUM

CUSTOMER L. I. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 16 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 190 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature]

5th LEVEL 30Hz Lo-PASS

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85

Specimen MOTOR CONTROL UNIT Axis of Test X-Y

Accel. No. 17 Axis X Control () Response (✓) OBE () SSE () DBE ()

Full Scale 100 g Damping 5, 1, 3 % Run No. 56

Operator [Signature] Engineer [Signature] 5TH LEVEL 30HZ LO-PASS

RESPONSE SPECTRUM

CUSTOMER L. L. N. L. Job No. 26447 Date 12-11-85
Specimen MOTOR CONTROL UNIT Axis of Test X-Y
Accel. No. 19 Axis X Control () Response (✓) OBE () SSE () DBE ()
Full Scale 100 g Damping 5, 1, 3 % Run No. 56
Operator [Signature] Engineer [Signature] 5th LEVEL 30Hz Lo-Pass

RESPONSE SPECTRUM