



BrightSource

California Energy Commission

**DOCKETED**  
**11-AFC-4**

TN # 68837

DEC. 11 2012

December 11, 2012

Pierre Martinez  
Project Manager  
Systems Assessment & Facility Siting Division  
California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, CA 95814

**SUBJECT:** Phase II CAISO Study of the Eastern Bulk Power System for Rio Mesa Solar Electric Generating Facility (11-AFC-4)

Dear Mr. Martinez:

Rio Mesa Solar I, LLC and Rio Mesa Solar II, LLC, collectively the “Applicant” for the Rio Mesa Solar Electric Generating Facility project (“Rio Mesa SEGF”), submits the following various Technical Appendices for the Phase II CAISO study of the Eastern Bulk Power System.

- Appendix C – Eastern Bulk Contingencies List;
- Appendix D – Post - 4030-QC3&4PH2 – Eastern – Peak Power Flow Plots;
- Appendix D – Pre – QC3&4PH2 – Eastern – Peak Power Flow Plots;
- Appendix D – Post – QC3&4PH2 – Eastern – Peak Power Flow Plots;
- Appendix F – Eastern Bulk Stability Plots; and
- Appendix H – QC3&4 Phase II.

If you have any questions, please do not hesitate to contact me.

Sincerely,



Todd Stewart  
Senior Director of Project Development

# APPENDIX C

Eastern Bulk Contingencies

| No. | Contingency Description  |
|-----|--|
| 1   | PARKER 230.0 to GENE 230.0 Circuit 1                                       |
| 2   | COACHELV 230.0 to MIRAGE 230.0 Circuit 1                                   |
| 3   | RAMON 230.0 to MIRAGE 230.0 Circuit 1                                      |
| 4   | CAMINO 230.0 to GENE 230.0 Circuit 1                                       |
| 5   | ETIWANDA 230.0 to SANBRDNO 230.0 Circuit 1                                 |
| 6   | ETIWANDA 230.0 to VSTA 230.0 Circuit 1                                     |
| 7   | SANBRDNO 230.0 to DEVERS 230.0 Circuit 1                                   |
| 8   | DEVERS 500.0 to VALLEYSC 500.0 Circuit 1                                   |
| 9   | DEVERS 500.0 to VALLEYSC 500.0 Circuit 2                                   |
| 10  | DEVERS 230.0 to MIRAGE 230.0 Circuit 1                                     |
| 11  | DEVERS 230.0 to MIRAGE 230.0 Circuit 2                                     |
| 12  | DEVERS 230.0 to VSTA 230.0 Circuit 2                                       |
| 13  | DEVERS 230.0 to OAK_VLLY 230.0 Circuit 1                                   |
| 14  | VSTA 230.0 to SANBRDNO 230.0 Circuit 2                                     |
| 15  | MNTVIEW 230.0 to SANBRDNO 230.0 Circuit 1                                  |
| 16  | MNTVIEW 230.0 to SANBRDNO 230.0 Circuit 2                                  |
| 17  | DEVRV1 500.0 to DEVERS 500.0 Circuit 1                                     |
| 18  | EAGLEMTN 230.0 to IRON MTN 230.0 Circuit 1                                 |
| 19  | IRON MTN 230.0 to CAMINO 230.0 Circuit 1                                   |
| 20  | JHINDMWD 230.0 to MIRAGE 230.0 Circuit 1                                   |
| 21  | JHINDMWD 230.0 to EAGLEMTN 230.0 Circuit 1                                 |
| 22  | OAK_VLLY 230.0 to SANBRDNO 230.0 Circuit 1                                 |
| 23  | IIDGEN 500.0 to DEVERS 500.0 Circuit 3                                     |
| 24  | ETIWANDA 230.0 to TOT186 230.0 Circuit 1                                   |
| 25  | TOT185HS 230.0 to DEVERS 230.0 Circuit 1                                   |
| 26  | TOT185HS 230.0 to VSTA 230.0 Circuit 1                                     |
| 27  | ClrdoRvr 500.0 to palo Verda 500.0 Circuit 1                               |
| 28  | ClrdoRvr 500.0 to RedBluff 500.0 Circuit 1                                 |
| 29  | ClrdoRvr 500.0 to RedBluff 500.0 Circuit 2                                 |
| 30  | DEVERS 500.0 to RedBluff 500.0 Circuit 1                                   |
| 31  | DEVERS 500.0 to RedBluff 500.0 Circuit 2                                   |
| 32  | RedBluff 500 to Valley 500 Circuit 1                                       |
| 33  | DEVERS 500.00 to DEVERS 230. Trans 1                                       |
| 34  | DEVERS 500.00 to DEVERS 230. Trans 2                                       |
| 35  | DEVERS 115.00 to DEVERS 230. Trans 1                                       |
| 36  | DEVERS 115.00 to DEVERS 230. Trans 3                                       |
| 37  | DEVERS 115.00 to DEVERS 230. Trans 4                                       |
| 38  | MIRAGE 230.00 to MIRAGE 115. Trans 1                                       |
| 39  | MIRAGE 230.00 to MIRAGE 115. Trans 2                                       |
| 40  | VSTA 230.00 to VSTA 115. Trans 5   |
| 41  | VSTA 230.00 to VSTA 115. Trans 6   |
| 42  | EAGLEMTN 230.00 to EAGLEMTN 161. Trans 1                                   |
| 43  | Colorado River to Red Bluff 500 ck 1, Colorado River to Red Bluff 500 ck 2 |
| 44  | LUGO to MOHAVE 500 ck 1, ELDORDO to LUGO 500 ck 1                          |
| 45  | LUGO to MIRALOMA 500 ck 2, LUGO to MIRALOMA 500 ck 3                       |
| 46  | RANCHOVST to SERRANO 500 ck 1, MIRALOMA to SERRANO 500 ck 1                |
| 47  | LUGO to VINCENT 500 ck 1, LUGO to VINCENT 500 ck 2                         |
| 48  | DEVERS to MIRAGE 230 ck 1, DEVERS to MIRAGE 230 ck 2                       |

| No. | Contingency Description  |
|-----|--|
| 49  | DEVERS to VSTA 230 ck 2, SANBRDNO to DEVERS 230 ck 1                   |
| 50  | DEVERS to VSTA 230 ck 2, DEVERS to OAK_VLLY 230 ck 1                   |
| 51  | DEVERS to VSTA 230 ck 2, OAK_VLLY to SANBRDNO 230 ck 1                 |
| 52  | DEVERS to VALLEYSC 500 ck 1, DEVERS to VALLEYSC 500 ck 2               |
| 53  | DEVERS to VSTA 230 ck 2, VSTA to SANBRDNO 230 ck 2                     |
| 54  | LEELAKE to VALLEYSC 500 ck 1, LEELAKE to LEAPS-MP 500 ck 1             |
| 55  | DEVERS to VSTA 230 ck 2, ETIWANDA to SANBRDNO 230 ck 1                 |
| 56  | ETIWANDA to SANBRDNO 230 ck 1, VSTA to SANBRDNO 230 ck 2               |
| 57  | ETIWANDA to SANBRDNO 230 ck 1, SANBRDNO to DEVERS 230 ck 1             |
| 58  | ETIWANDA to SANBRDNO 230 ck 1, ETIWANDA to VSTA 230 ck 1               |
| 59  | RANCHVST to PADUA 230 ck 1, RANCHVST to PADUA 230 ck 2                 |
| 60  | RANCHVST to MIRALOME 230 ck 1, RANCHVST to MIRALOME 230 ck 2           |
| 61  | RANCHVST to ETIWANDA 230 ck 1, RANCHVST to ETIWANDA 230 ck 2           |
| 62  | MIRALOME to OLINDA 230 ck 1, MIRALOMW to WALNUT 230 ck 1               |
| 63  | OLINDA to WALNUT 230 ck 1, CENTER S to OLINDA 230 ck 1                 |
| 64  | CENTER S to OLINDA 230 ck 1, MESA CAL to WALNUT 230 ck 1               |
| 65  | MIRALOME to OLINDA 230 ck 1, CENTER S to OLINDA 230 ck 1               |
| 66  | MIRALOME to OLINDA 230 ck 1, OLINDA to WALNUT 230 ck 1                 |
| 67  | MIRALOMW to WALNUT 230 ck 1, OLINDA to WALNUT 230 ck 1                 |
| 68  | CHINO to MIRALOMW 230 ck 1, CHINO to MIRALOMW 230 ck 2                 |
| 69  | CHINO to MIRALOMW 230 ck 1, CHINO to MIRALOME 230 ck 3                 |
| 70  | CHINO to MIRALOMW 230 ck 2, CHINO to MIRALOME 230 ck 3                 |
| 71  | CHINO to SERRANO 230 ck 1, VIEJOSC to CHINO 230 ck 1                   |
| 72  | CHINO to SERRANO 230 ck 1, S.ONOFRE to SERRANO 230 ck 1                |
| 73  | VIEJOSC to CHINO 230 ck 1, S.ONOFRE to SERRANO 230 ck 1                |
| 74  | VIEJOSC to S.ONOFRE 230 ck 1, S.ONOFRE to SERRANO 230 ck 1             |
| 75  | S.ONOFRE to SANTIAGO 230 ck 1, S.ONOFRE to SANTIAGO 230 ck 2           |
| 76  | S.ONOFRE to SANTIAGO 230 ck 1, S.ONOFRE to SERRANO 230 ck 1            |
| 77  | S.ONOFRE to SANTIAGO 230 ck 2, S.ONOFRE to SERRANO 230 ck 1            |
| 78  | S.ONOFRE to SANTIAGO 230 ck 1, VIEJOSC to S.ONOFRE 230 ck 1            |
| 79  | S.ONOFRE to SANTIAGO 230 ck 2, VIEJOSC to S.ONOFRE 230 ck 1            |
| 80  | SERRANO to VILLA PK 230 ck 1, SERRANO to VILLA PK 230 ck 2             |
| 81  | LEWIS to SERRANO 230 ck 1, LEWIS to SERRANO 230 ck 2                   |
| 82  | SERRANO to VILLA PK 230 ck 1, LEWIS to SERRANO 230 ck 1                |
| 83  | SERRANO to VILLA PK 230 ck 1, LEWIS to SERRANO 230 ck 2                |
| 84  | SERRANO to VILLA PK 230 ck 2, LEWIS to SERRANO 230 ck 1                |
| 85  | SERRANO to VILLA PK 230 ck 2, LEWIS to SERRANO 230 ck 2                |
| 86  | BARRE to VILLA PK 230 ck 1, LEWIS to VILLA PK 230 ck 1                 |
| 87  | BARRE to VILLA PK 230 ck 1, BARRE to LEWIS 230 ck 1                    |
| 88  | CHINO to MIRALOMW 230 ck 1, RANCHVST to SERRANO 500 ck 1               |
| 89  | CHINO to MIRALOME 230 ck 3, RANCHVST to SERRANO 500 ck 1               |
| 90  | CHINO to MIRALOMW 230 ck 2, RANCHVST to SERRANO 500 ck 1               |
| 91  | MIRALOMW to WALNUT 230 ck 1, RANCHVST to SERRANO 500 ck 1              |
| 92  | OLINDA to WALNUT 230 ck 1, RANCHVST to SERRANO 500 ck 1                |
| 93  | CHINO to SERRANO 230 ck 1, RANCHVST to SERRANO 500 ck 1                |
| 94  | VIEJOSC to CHINO 230 ck 1, RANCHVST to SERRANO 500 ck 1                |
| 95  | CHINO 230.00 - TOT217 230.00 1, MIRALOMA 230.00 - WALNUT 230.00 1      |
| 96  | CHINO 230.00 - TOT217 230.00 1, MIRALOMA 230.00 - OLINDA 230.00 1      |
| 97  | ETIWANDA 230.00 - SANBRDNO 230.00 1, MIRALOMA 230.00 - TOT216 230.00 1 |
| 98  | DEVERS 230.00 - MIRAGE 230.00 1, J.HINDS 230.00 - MIRAGE 230.00 1      |

| No. | Contingency Description  |
|-----|--|
| 99  | RAMON 230.00 - MIRAGE 230.00 1, J.HINDS 230.00 - MIRAGE 230.00 1           |
| 100 | ETIWANDA 230.00 - SANBRDNO 230.00 1, LUGO 500.00 - MIRALOMA 500.00 2       |
| 101 | ETIWANDA 230.00 - VSTA 230.00 1, LUGO 500.00 - MIRALOMA 500.00 3           |
| 102 | CHINO 230.00 - TOT217 230.00 1, MIRALOMA 500.00 - SERRANO 500.00 1         |
| 103 | MOENKOPI 500.00 - ELDORDO 500.00 1, PISGAH 230.00 - ELDORDO 230.00 2       |
| 104 | DEVERS 230.00 - MIRAGE 230.00 1, RAMON 230.00 - MIRAGE 230.00 1            |
| 105 | LUGO 500.00 - MIRALOMA 500.00 3, LUGO 500.00 - MOHAVE 500.00 1             |
| 106 | CHINO 230.00 - MIRALOMA 230.00 2, MIRALOMA 230.00 - WALNUT 230.00 1        |
| 107 | CHINO 230.00 - MIRALOMA 230.00 3, MIRALOMA 230.00 - OLINDA 230.00 1        |
| 108 | TOT217 230.00 - SERRANO 230.00 1, LEWIS 230.00 - SERRANO 230.00 2          |
| 109 | TOT217 230.00 - SERRANO 230.00 1, SERRANO 230.00 - VILLA PK 230.00 2       |
| 110 | DEVERS-MIRAGE 230 KV & RAMON-MIRAGE 230 KV                                 |
| 111 | OAK VALLEY-SAN BERNARDINO 230 KV & ETIWANDA-SAN BERNARDINO 230 KV          |
| 112 | RAMON-MIRAGE 230 KV & JULIAN HINDS-MIRAGE 230 KV (SUMMER)                  |
| 113 | OAK VALLEY-SAN BERNARDINO 230 KV & SAN BERNARDINO-VISTA 230 KV             |
| 114 | DEVERS-SAN BERNARDINO 230 KV NO.1 & DEVERS-OAK VALLEY 230 KV               |
| 115 | DEVERS-OAK VALLEY 230 KV & OAK VALLEY-SAN BERNARDINO 230 KV                |
| 116 | DEVERS 500.00 - VALLEYSC 500.00 1, COLORADO RIVER 500.00 - DEVERS 500.00 1 |
| 117 | PALO VERDE-MIDPOINT & MIDPOINT-DEVERS 500-KV                               |
| 118 | JURUPA 230.00 - VSTA 230.00 1, TOT216 230.00 - VSTA 230.00 1               |
| 119 | JURUPA 230.00 - MIRALOMA 230.00 1, tot216 230.00 - VSTA 230.00 1           |
| 120 | CHINO 230.00 - VIEJO 230.00 1, MIRALOMA 230.00 - WALNUT 230.00 1           |
| 121 | RED BLUFF TO DEVERS 500 ck 1, RED BLUFF TO DEVERS 500 ck 2                 |
| 122 | CHINO 230.00 - VIEJO 230.00 1, MIRALOMA 500.00 - SERRANO 500.00 1          |
| 123 | CHINO 230.00 - MIRALOMA 230.00 1, CHINO 230.00 - VIEJO 230.00 1            |
| 124 | EAGLROCK to MESA CAL 230 ck 1, GOODRICH to LAGUBELL 230 ck 1               |
| 125 | GOODRICH - LAGUBELL 230.00 ck 1, VINCENT - MESA CAL 230.00 ck 1            |
| 126 | CENTER S - MESA CAL 230.00 ck 1, LAGUBELL - RIOHONDO 230.00 ck 1           |
| 127 | LAGUBELL - RIOHONDO 230.00 ck 1, MESA CAL - RIOHONDO 230.00 ck 1           |
| 128 | LAGUBELL - RIOHONDO 230.00 ck 1, MESA CAL - WALNUT 230.00 ck 1             |
| 129 | MESA CAL - RIOHONDO 230.00 ck 1, MESA CAL - WALNUT 230.00 ck 1             |
| 130 | CENTER S - MESA CAL 230.00 ck 1, MESA CAL - RIOHONDO 230.00 ck 1           |
| 131 | CENTER S - MESA CAL 230.00 ck 1, CENTER S - OLINDA 230.00 ck 1             |
| 132 | CENTER S - MESA CAL 230.00 ck 1, MESA CAL - WALNUT 230.00 ck 1             |
| 133 | MESA CAL - WALNUT 230.00 ck 1, MIRALOMA - WALNUT 230.00 ck 1               |
| 134 | MESA CAL - WALNUT 230.00 ck 1, OLINDA - WALNUT 230.00 ck 1                 |
| 135 | CENTER S - OLINDA 230.00 ck 1, MIRALOMA - WALNUT 230.00 ck 1               |
| 136 | AlberHill 500.0 to VALLEYSC 500.0 Circuit 1                                |
| 137 | AlberHill 500.0 to VALLEYSC 500.0 Circuit 2                                |
| 138 | AlberHill 500.0 to Serrano 500.0 Circuit 1                                 |
| 139 | AlberHill 500.0 to Serrano 500.0 Circuit 2                                 |
| 140 | AlberHill 500.0 to VALLEYSC 500.0 Circuit 1, and Circuit 2                 |
| 141 | AlberHill 500.0 to Serrano 500.0 Circuit 2 and Circuit 2                   |
| 142 | Red Bluff 500 to Salton Sea 500  |
| 143 | Salton Sea 500 to Valley   |
| 144 | Red Bluff 500kV to Colorado River 500kV Circuit 3                          |

# APPENDIX D

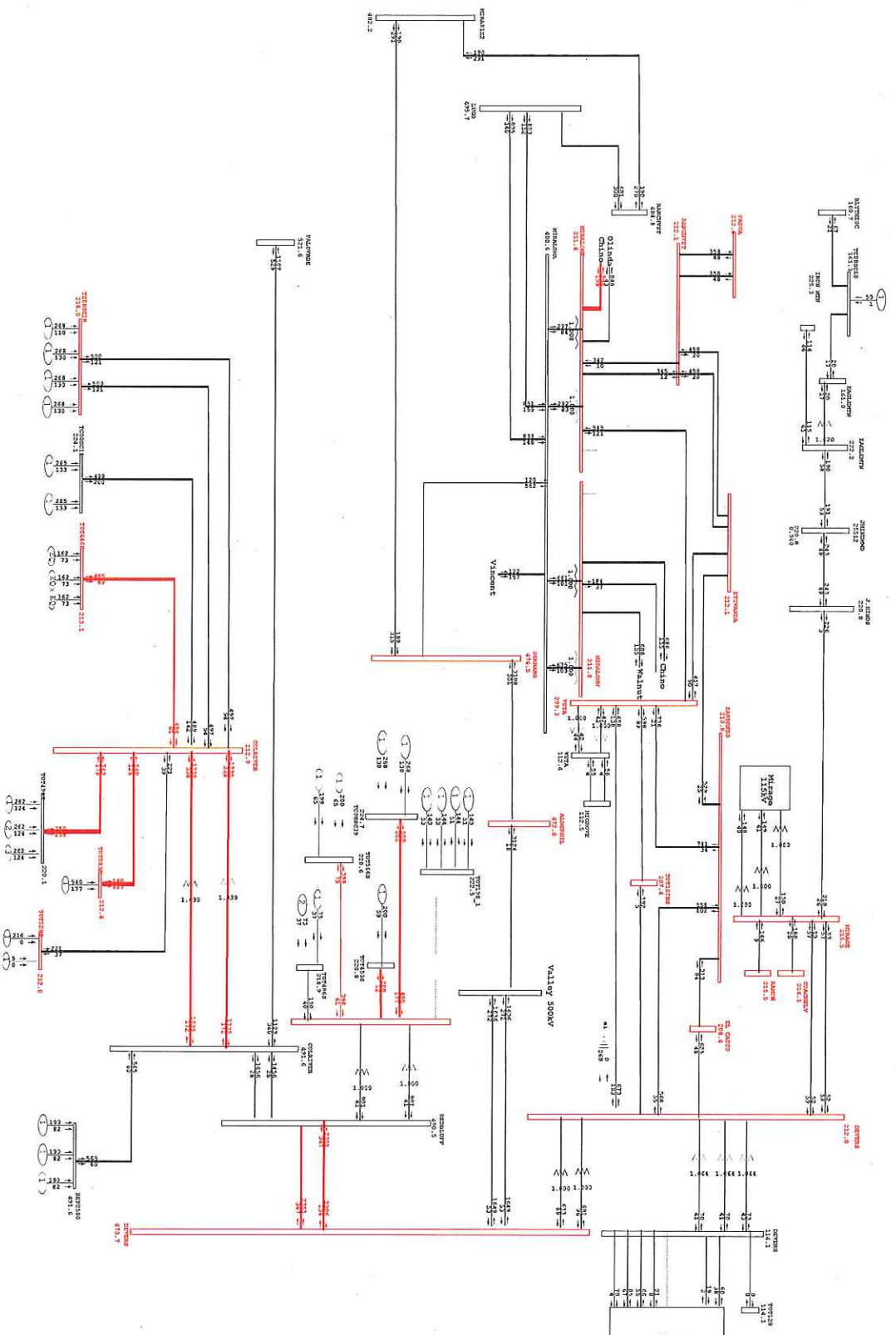




# APPENDIX D



# APPENDIX D



General Electric International, Inc. PSIF Program Med Oct 17 10:35:35 2012 c:\documents and settings\mohammad\desktop\metro\_gc34p2 appendix\new folder\p

Heavy Summer Base Case

SCP Eastern Bulk System Study, Post-Queue Cluster 3&4 Phase 2 Case

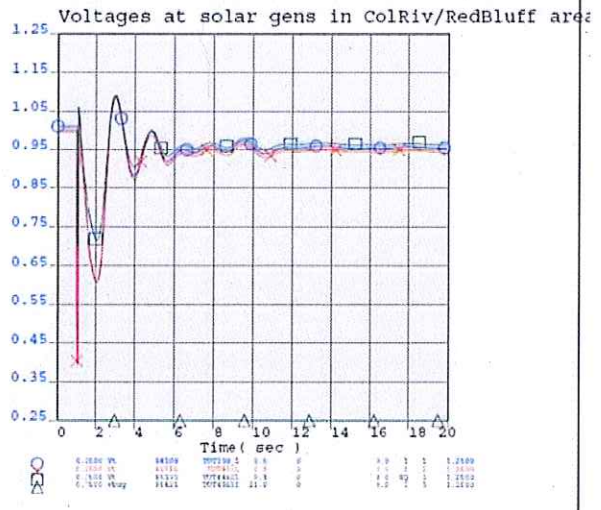
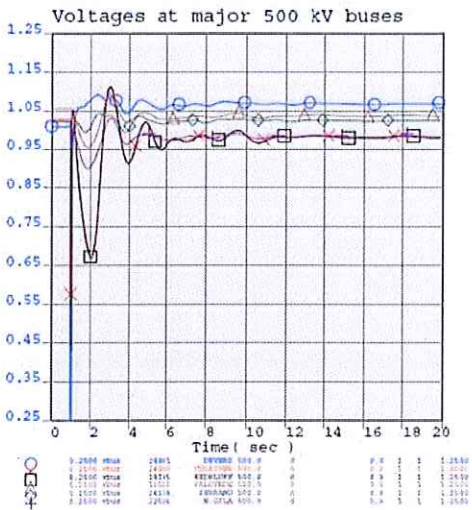
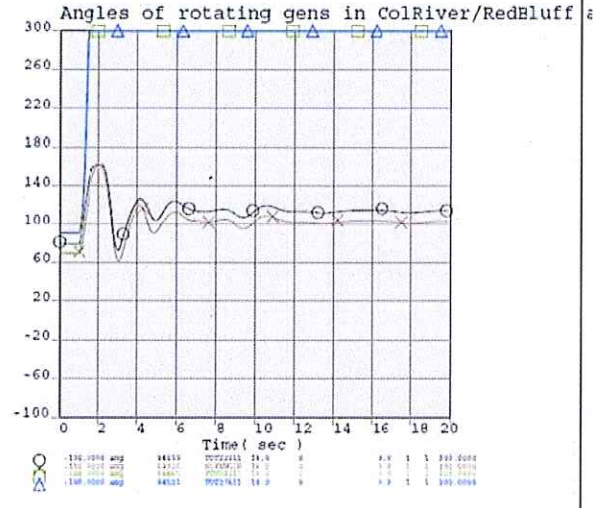
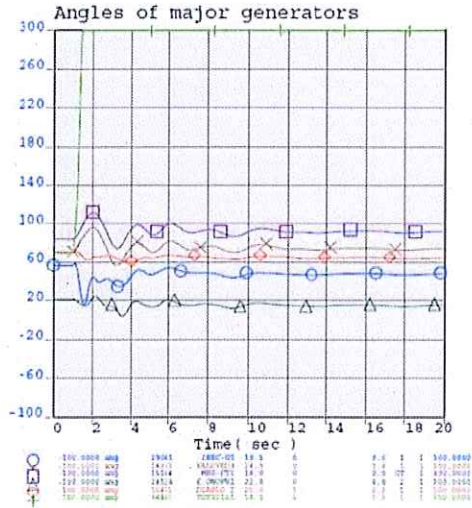
MM/MVZR

Rating = 1

# APPENDIX F

## Peak Case Pre QC3&4 Phase II

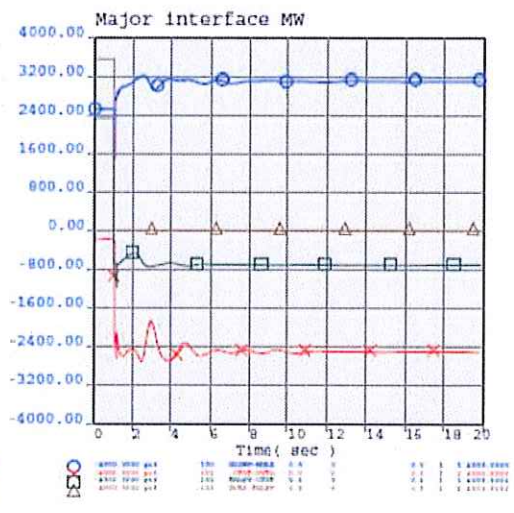
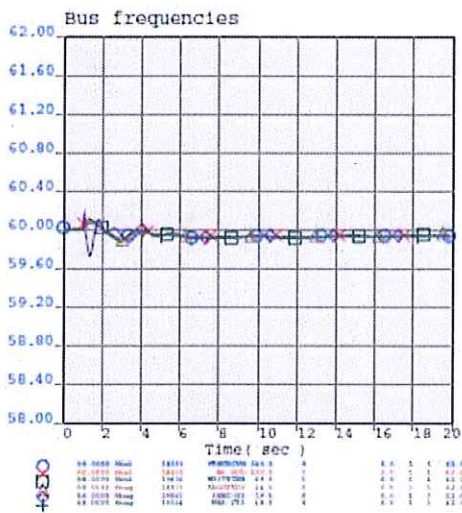
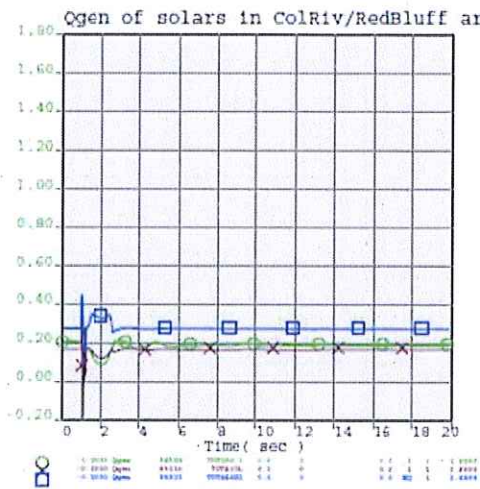
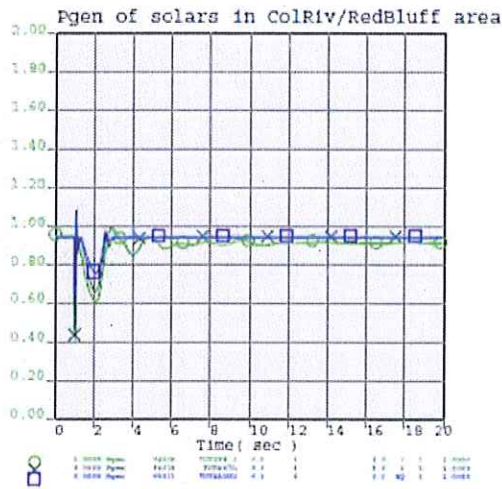
Pre-project. Part 1. 4-cycles 3-ph fault at Devers 500 kV  
with loss of both Devers-RedBluff- 500kV lines  
RAS: 1,270MW



Devers-RedBluff DLO  
with 4-cycles 3-phase fault at Devers



Pre-project. Part 2. 4-cycles 3-ph fault at Devers 500 kV  
 with loss of both RedBluff-ColRiver500kV lines  
 RAS: 1,270MW



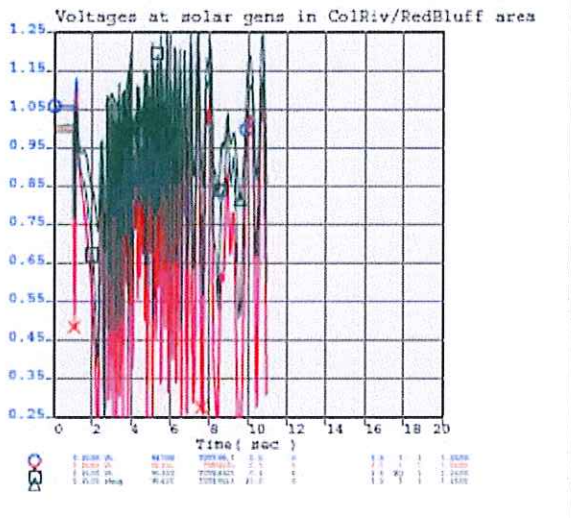
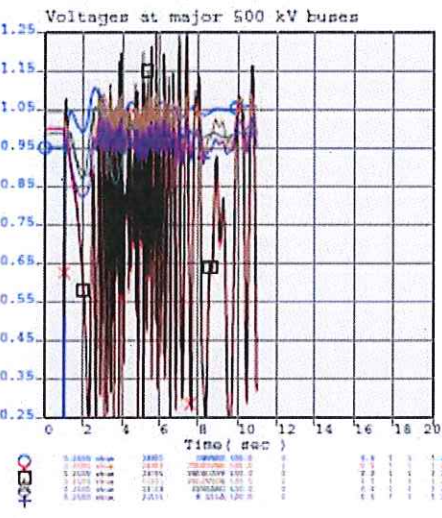
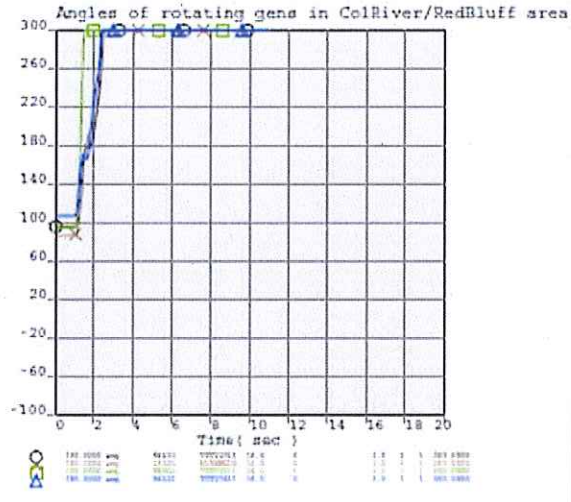
Devers-RedBluff DLO  
 with 4-cycles 3-phase fault at Devers



Temp.chf

# Peak Case Post QC3&4 Phase II

Peak. Post-project. Part 1. 4-cycles 3-ph fault at Devers  
 500 kV with loss of both Devers-RedBluff- 500kV lines  
 RAS: 2,760 MW, FACRI

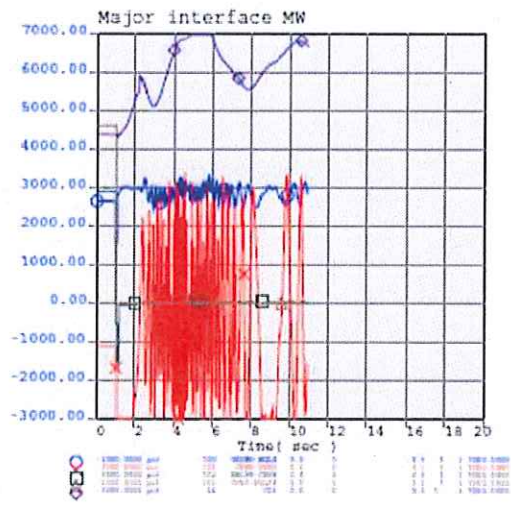
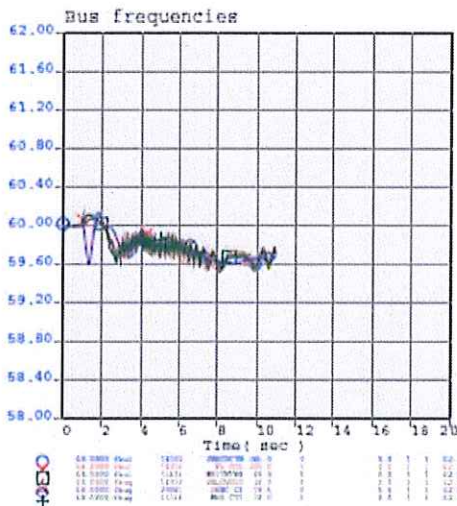
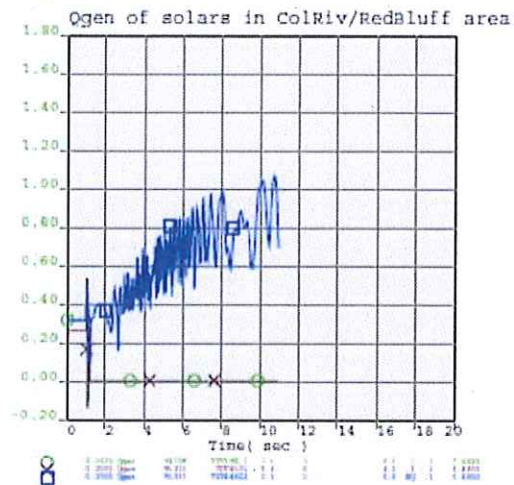
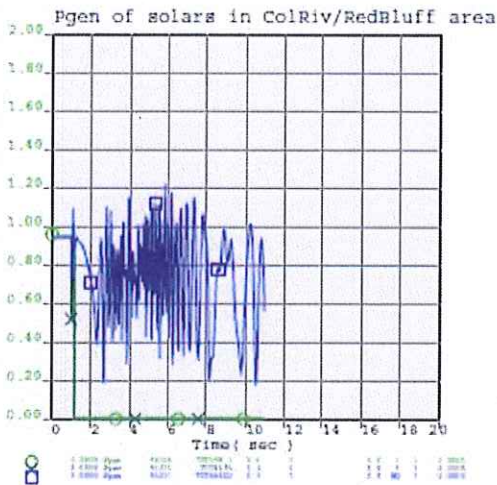


Devers-RedBluff DLO with 4-cycles 3-phase fault at Devers





Peak. Post-project. Part 2. 4-cycles 3-ph fault at Devers  
 500 kV with loss of both RedBluff-ColRiver500kV lines  
 RAS: 2,760MW, FACRI

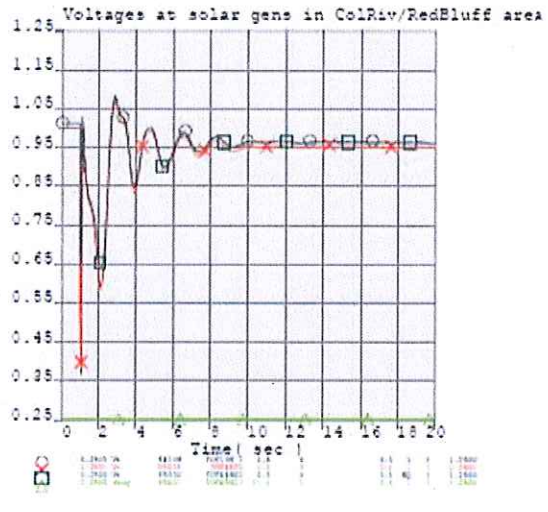
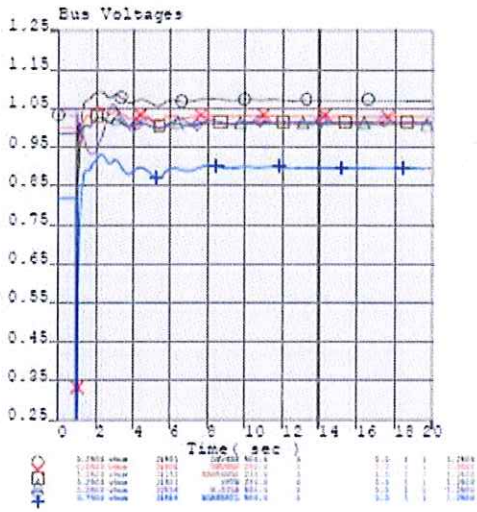
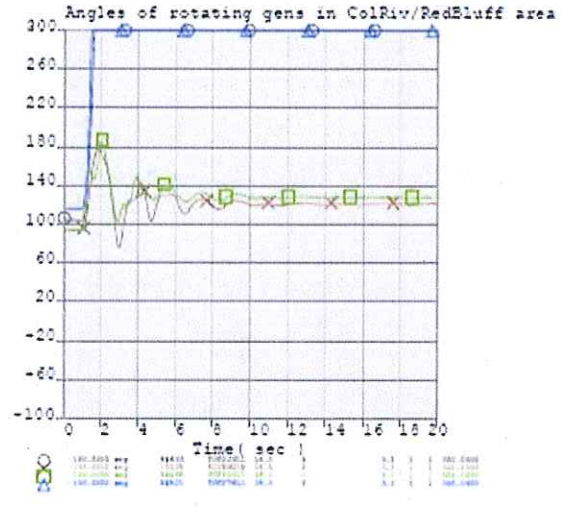
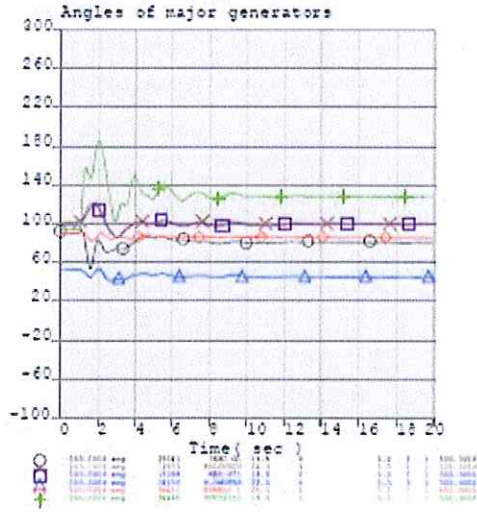


Devers-RedBluff DLO with 4-cycles 3-phase fault at Devers



## Off Peak Case Pre QC3&4 Phase II

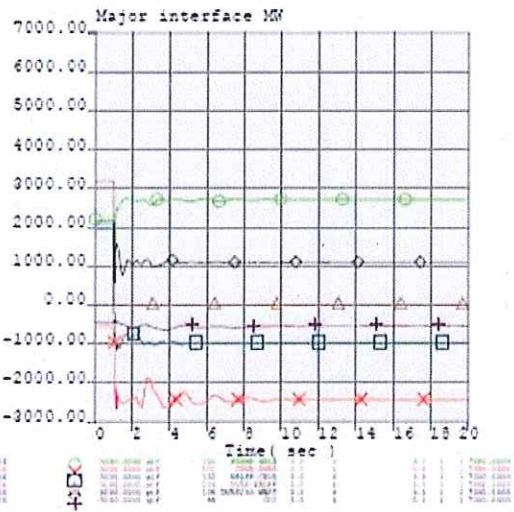
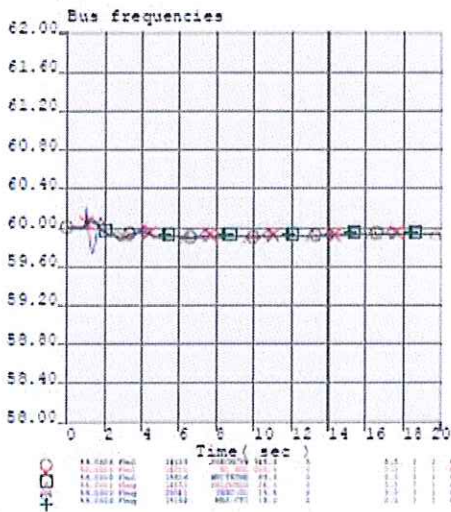
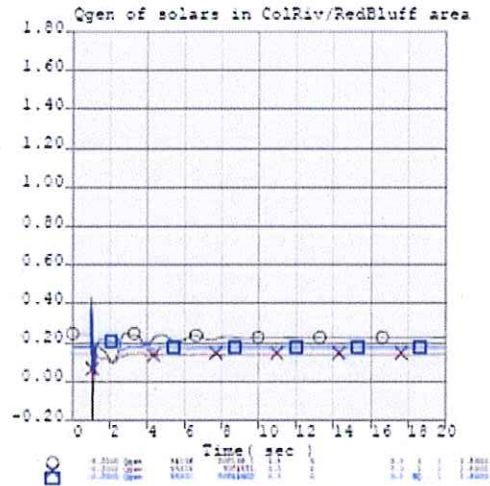
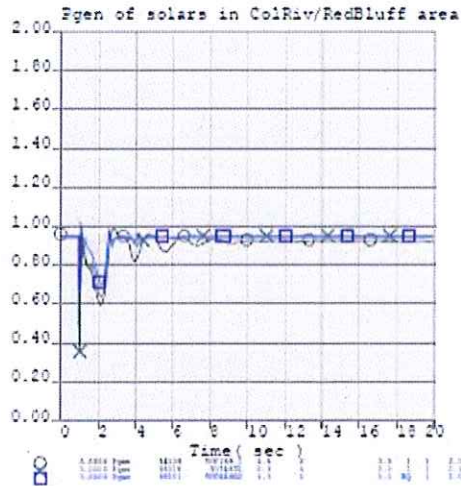
Off-peak, Pre-project. Part 1. 4-cycles 3-ph fault at Devers 500 kV  
Devers-RedBluff DLO  
RAS: 1380MW



Devers-RedBluff DLO  
with 4-cycles 3-phase fault at Devers



Off-peak, Pre-project. Part 2. 4-cycles 3-ph fault at Devers 500 kV  
 Devers-RedBluff DLO  
 RAS: 1380MW

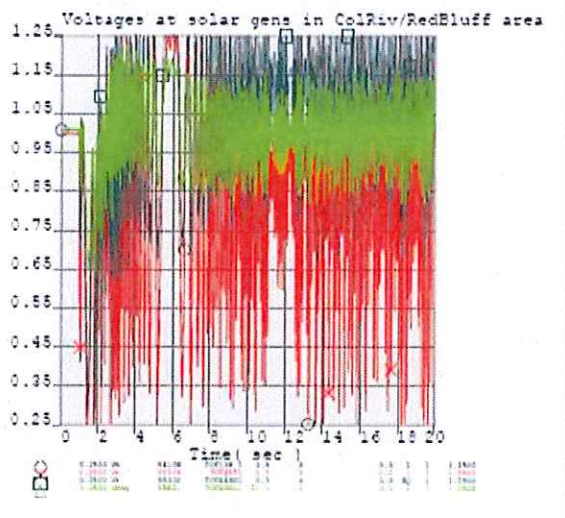
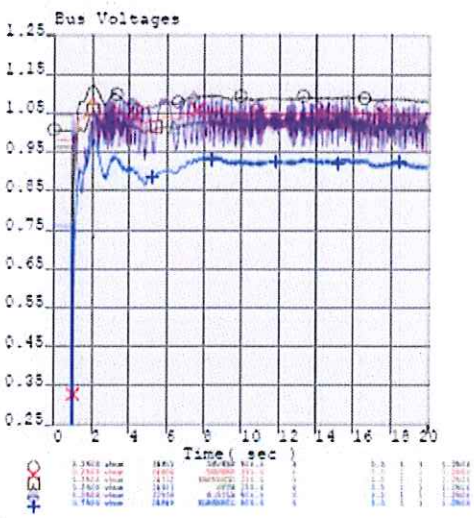
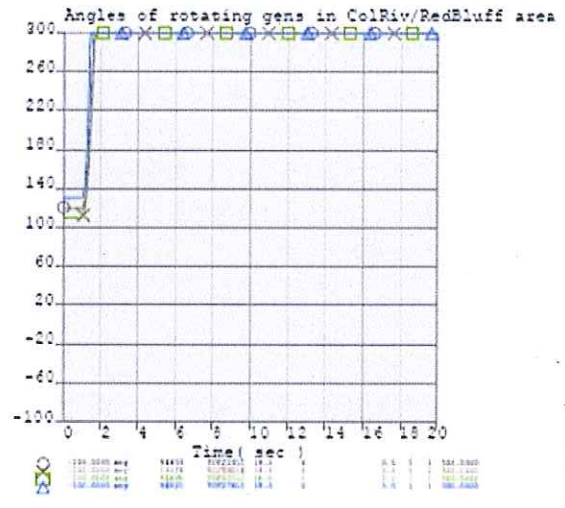
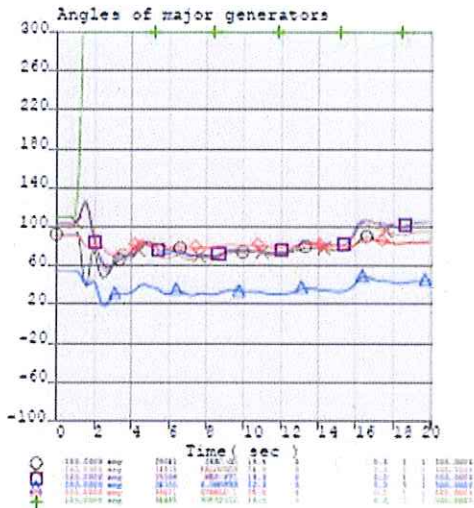


Devers-RedBluff DLO  
 with 4-cycles 3-phase fault at Devers



## Off Peak Case Post QC3&4 Phase II

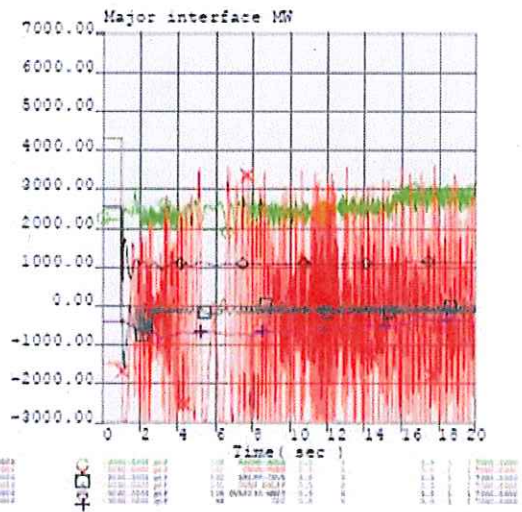
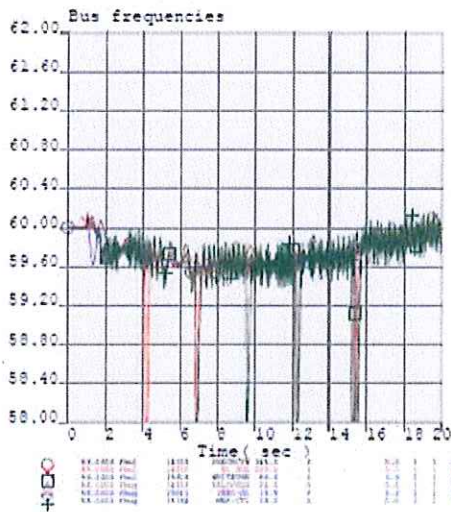
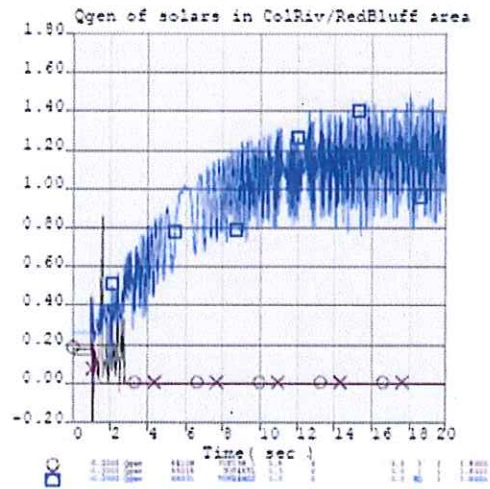
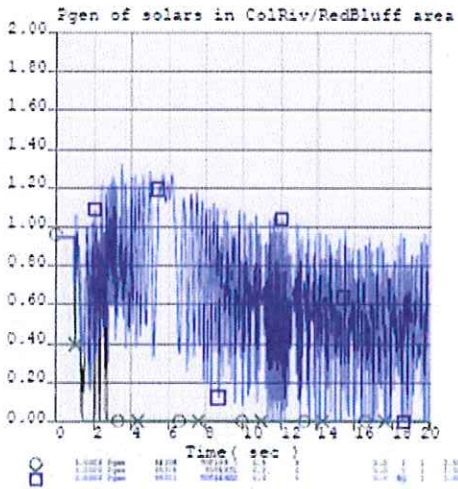
Off-peak, Post-project. Part 1. 4-cycles 3-ph fault at Devers 500 kV  
with loss of 2xPalo Verde - Devers 500 kV  
RAS: 1460MW



Devers-REDBLUFF DLO  
with 4-cycles 3-phase fault at Devers



Off-peak, Post-project. Part 2. 4-cycles 3-ph fault at Devers 500 kV  
 with loss of 2xPalo Verde - Devers 500 kV  
 RAS: 1460MW

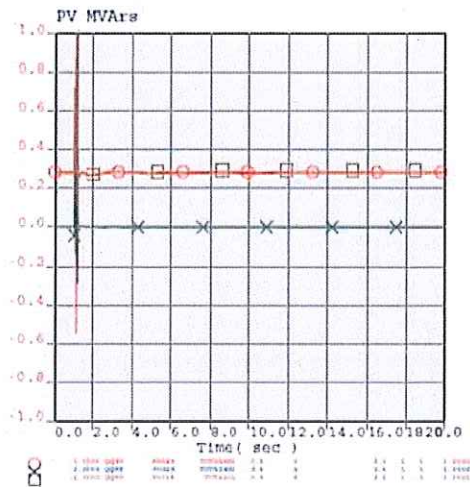
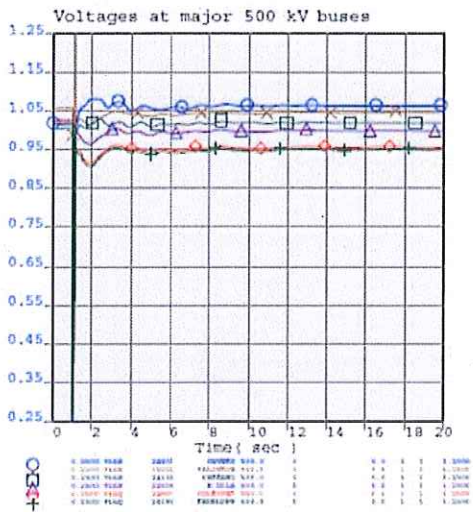
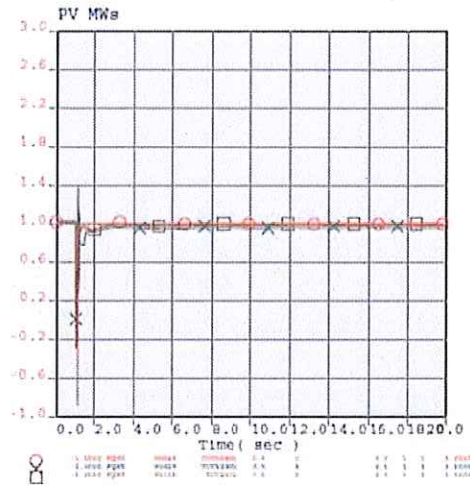
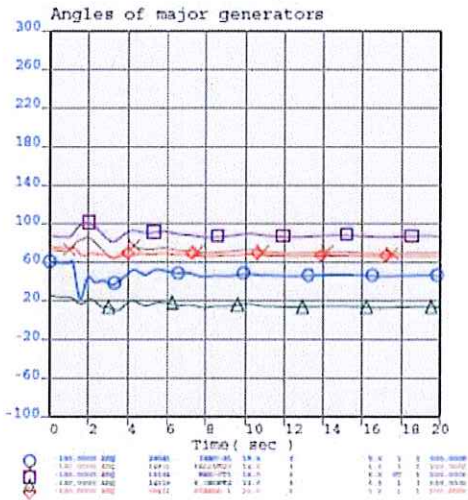


Devers-REDBLUFF DLO  
 with 4-cycles 3-phase fault at Devers



# PV Dispatch limited to 3100 MW

QC3&C4=3,100MW. Only PV. No extra VARs.  
 4-cycles 3-ph fault at Devers 500 kV with loss  
 of both Devers-RedBluff 500kV lines. RAS=1,400 MW

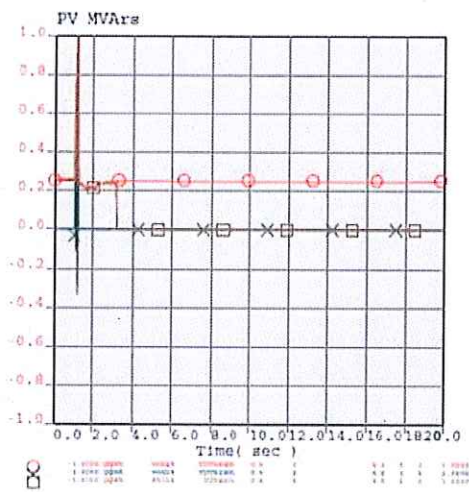
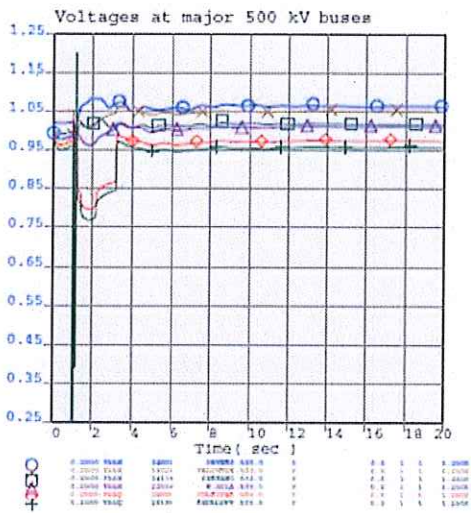
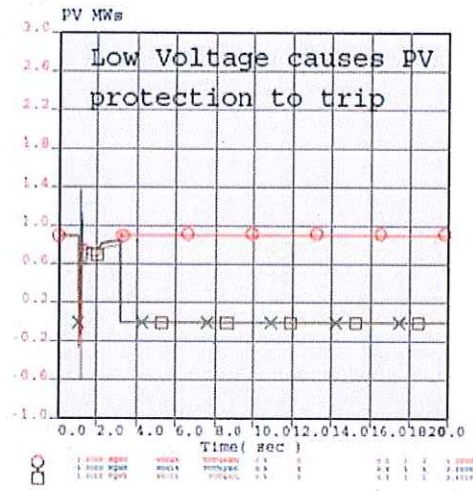
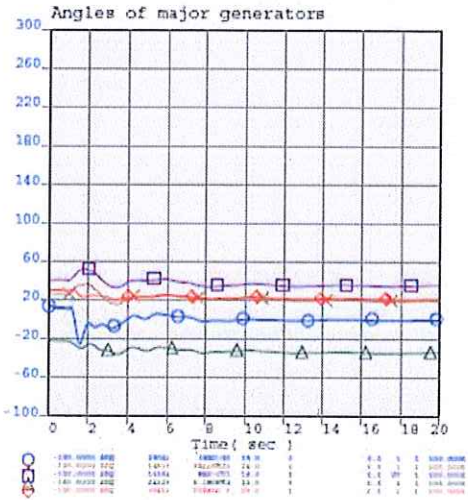


Devers-RedBluff D/O with 4-cycles 3-phase fault at Devers



# PV Dispatch Exceeds 3100MW

QC3&C4=3,155MW. Only PV. No extra VARs.  
 4-cycles 3-ph fault at Devers 500 kV with loss  
 of both Devers-RedBluff 500kV lines. RAS=1,400 MW

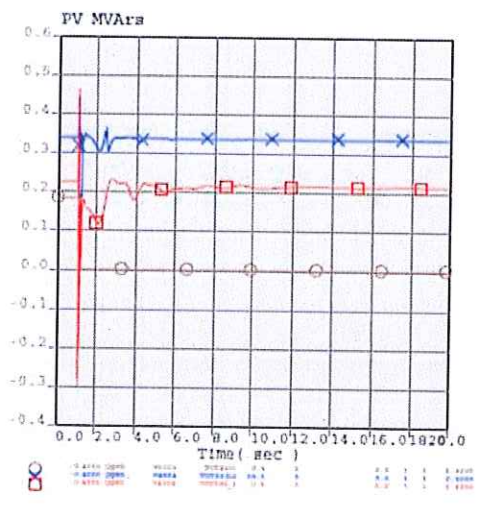
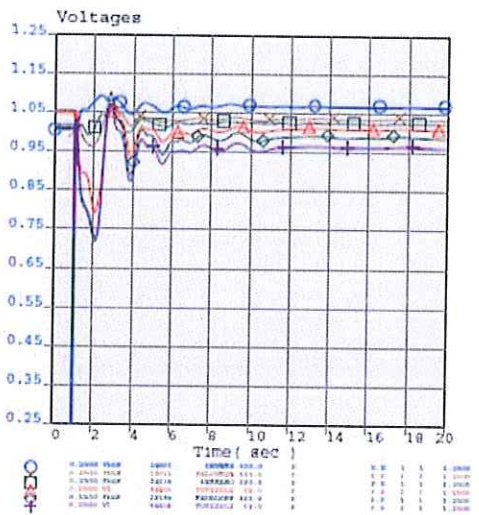
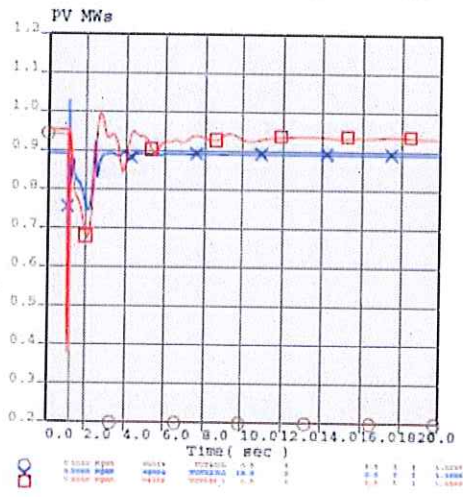
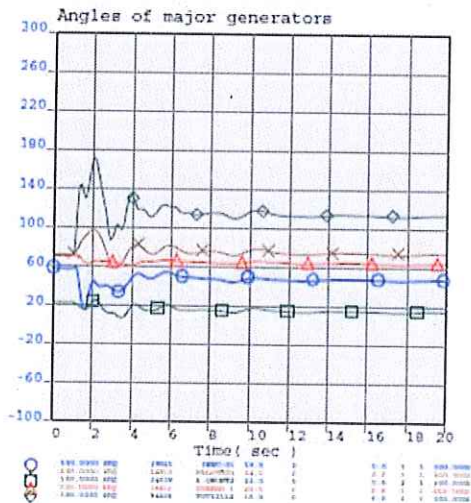


Devers-RedBluff DLO with 4-cycles 3-phase fault at Devers



# Dispatch limited to 4000MW

Dispatch 4000 MW No extra VARs.  
 4-cycles 3-ph fault at Devers 500 kV with loss  
 of both Devers-RedBluff 500kV lines. RAS=1,390 MW



Devers-RedBluff DLO  
 with 4-cycles 3-phase fault at Devers





# APPENDIX H

Table H.3.1a  
Existing System with Inclusion of Projects in 2012  
Three-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | Existing System |      | End of 2012 |      | Delta kA |
|------------------------|-------------|-----------------|------|-------------|------|----------|
|                        |             | X/R             | kA   | X/R         | kA   |          |
| Antelope               | 500         | 20.9            | 25.5 | 20.9        | 29.5 | 4.0      |
| Eldorado (Joint-Owned) | 500         | 13.4            | 41.3 | 13.4        | 41.5 | 0.2      |
| Lugo                   | 500         | 22.0            | 43.9 | 22.2        | 44.6 | 0.7      |
| Mira Loma              | 500         | 24.1            | 33.0 | 24.4        | 33.7 | 0.7      |
| Serrano                | 500         | 25.6            | 29.4 | 25.9        | 29.9 | 0.5      |
| Vincent                | 500         | 19.2            | 37.2 | 19.5        | 38.6 | 1.4      |
| Antelope               | 230         | 21.1            | 41.0 | 21.9        | 43.1 | 2.1      |
| Barre                  | 230         | 22.1            | 59.4 | 22.1        | 60.1 | 0.7      |
| Center                 | 230         | 14.8            | 40.2 | 14.9        | 41.4 | 1.2      |
| Chino                  | 230         | 15.1            | 36.5 | 15.0        | 37.0 | 0.5      |
| Del Amo                | 230         | 16.8            | 44.5 | 16.7        | 45.4 | 0.9      |
| Devers                 | 230         | 13.6            | 29.2 | 14.6        | 32.1 | 2.9      |
| El Casco               | 230         | 10.4            | 13.0 | 10.4        | 13.1 | 0.1      |
| El Nido                | 230         | 18.7            | 35.9 | 19.2        | 37.9 | 2.0      |
| El Segundo             | 230         | 18.6            | 31.2 | 19.5        | 33.3 | 2.1      |
| Eldorado (Joint-Owned) | 230         | 16.9            | 54.1 | 16.9        | 56.0 | 1.9      |
| Ellis                  | 230         | 17.7            | 43.1 | 17.6        | 43.3 | 0.2      |
| Etiwanda               | 230         | 25.5            | 53.9 | 25.5        | 54.7 | 0.8      |
| Hinson                 | 230         | 18.0            | 39.9 | 17.9        | 40.6 | 0.7      |
| Huntington Beach       | 230         | 14.7            | 31.0 | 14.7        | 31.1 | 0.1      |
| La Fresa               | 230         | 24.0            | 42.4 | 24.1        | 44.3 | 1.9      |
| Laguna Bell            | 230         | 15.6            | 34.5 | 15.5        | 35.0 | 0.5      |
| Lewis                  | 230         | 21.3            | 48.0 | 21.3        | 48.5 | 0.5      |
| Lighthipe              | 230         | 17.3            | 42.0 | 17.2        | 42.8 | 0.8      |
| Long Beach             | 230         | 12.4            | 27.1 | 12.3        | 27.4 | 0.3      |
| Lugo                   | 230         | 28              | 39.0 | 28.1        | 39.2 | 0.2      |
| Merchant (SDG&E)       | 230         | 0               | 0    | 15.3        | 44.9 | 44.9     |
| Mesa                   | 230         | 15.4            | 47.3 | 15.6        | 49.6 | 2.3      |
| Mira Loma (A)          | 230         | 22.0            | 46.8 | 22.2        | 47.8 | 1.0      |
| Mira Loma (B)          | 230         | 24.4            | 52.9 | 24.5        | 54.0 | 1.1      |
| Olinda                 | 230         | 13.6            | 27.2 | 14.7        | 30.0 | 2.8      |
| Pardee                 | 230         | 15.9            | 54.7 | 15.9        | 55.1 | 0.4      |
| Rancho Vista           | 230         | 25.8            | 54.7 | 25.8        | 55.5 | 0.8      |
| Redondo                | 230         | 24.6            | 42.8 | 24.6        | 44.2 | 1.4      |
| Rio Hondo              | 230         | 14.5            | 30.8 | 14.5        | 31.3 | 0.5      |
| San Bernardino         | 230         | 18.6            | 36.8 | 18.4        | 37.3 | 0.5      |
| Serrano                | 230         | 26.3            | 56.5 | 26.4        | 57.2 | 0.7      |
| Sylmar (SCE)           | 230         | 15.3            | 60.1 | 15.3        | 60.4 | 0.3      |
| Villa Park             | 230         | 24.8            | 49.7 | 24.8        | 50.2 | 0.5      |
| Vincent                | 230         | 21.7            | 55.2 | 22.0        | 56.2 | 1.0      |
| Vista                  | 230         | 16.1            | 45.3 | 15.9        | 46.1 | 0.8      |
| Walnut                 | 230         | 13.3            | 28.6 | 15.9        | 34.9 | 6.3      |
| Altwind                | 115         | 8.8             | 16.1 | 8.8         | 16.6 | 0.5      |
| Devers                 | 115         | 19.1            | 24.4 | 20.1        | 25.7 | 1.3      |
| Garnet                 | 115         | 12.9            | 18.5 | 13.0        | 19.1 | 0.6      |
| Ivanpah                | 115         | 0               | 0    | 4.9         | 3.6  | 3.6      |
| Sanwind                | 115         | 8.4             | 13.3 | 8.5         | 14.0 | 0.7      |
| Tamarisk               | 115         | 7.3             | 13.6 | 7.3         | 13.9 | 0.3      |
| Terawind               | 115         | 12.0            | 20.2 | 12.1        | 21.0 | 0.8      |
| Tiffanywind            | 115         | 10.5            | 18.7 | 10.5        | 19.4 | 0.7      |
| Venwind                | 115         | 5.6             | 15.3 | 5.5         | 15.8 | 0.5      |
| Antelope               | 66          | 25.6            | 34.1 | 26.1        | 34.4 | 0.3      |

|         |    |      |      |      |      |     |
|---------|----|------|------|------|------|-----|
| Windhub | 66 | 58.1 | 13.1 | 58.9 | 13.4 | 0.3 |
|---------|----|------|------|------|------|-----|

Table H.3.1b

## Existing System with Inclusion of Projects in 2012

## Single-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | Existing System |      | End of 2012 |      | Delta kA |
|------------------------|-------------|-----------------|------|-------------|------|----------|
|                        |             | X/R             | kA   | X/R         | kA   |          |
| Antelope               | 500         | 20.9            | 25.5 | 20.9        | 29.5 | 4.0      |
| Eldorado (Joint-Owned) | 500         | 13.4            | 41.3 | 13.4        | 41.5 | 0.2      |
| Lugo                   | 500         | 22.0            | 43.9 | 22.2        | 44.6 | 0.7      |
| Mira Loma              | 500         | 24.1            | 33.0 | 24.4        | 33.7 | 0.7      |
| Serrano                | 500         | 25.6            | 29.4 | 25.9        | 29.9 | 0.5      |
| Vincent                | 500         | 19.2            | 37.2 | 19.5        | 38.6 | 1.4      |
| Antelope               | 230         | 21.1            | 41.0 | 21.9        | 43.1 | 2.1      |
| Barre                  | 230         | 22.1            | 59.4 | 22.1        | 60.1 | 0.7      |
| Center                 | 230         | 14.8            | 40.2 | 14.9        | 41.4 | 1.2      |
| Chino                  | 230         | 15.1            | 36.5 | 15.0        | 37.0 | 0.5      |
| Del Amo                | 230         | 16.8            | 44.5 | 16.7        | 45.4 | 0.9      |
| Devers                 | 230         | 13.6            | 29.2 | 14.6        | 32.1 | 2.9      |
| El Casco               | 230         | 10.4            | 13.0 | 10.4        | 13.1 | 0.1      |
| El Nido                | 230         | 18.7            | 35.9 | 19.2        | 37.9 | 2.0      |
| El Segundo             | 230         | 18.6            | 31.2 | 19.5        | 33.3 | 2.1      |
| Eldorado (Joint-Owned) | 230         | 16.9            | 54.1 | 16.9        | 56.0 | 1.9      |
| Ellis                  | 230         | 17.7            | 43.1 | 17.6        | 43.3 | 0.2      |
| Etiwanda               | 230         | 25.5            | 53.9 | 25.5        | 54.7 | 0.8      |
| Hinson                 | 230         | 18.0            | 39.9 | 17.9        | 40.6 | 0.7      |
| Huntington Beach       | 230         | 14.7            | 31.0 | 14.7        | 31.1 | 0.1      |
| La Fresa               | 230         | 24.0            | 42.4 | 24.1        | 44.3 | 1.9      |
| Laguna Bell            | 230         | 15.6            | 34.5 | 15.5        | 35.0 | 0.5      |
| Lewis                  | 230         | 21.3            | 48.0 | 21.3        | 48.5 | 0.5      |
| Lighthipe              | 230         | 17.3            | 42.0 | 17.2        | 42.8 | 0.8      |
| Long Beach             | 230         | 12.4            | 27.1 | 12.3        | 27.4 | 0.3      |
| Lugo                   | 230         | 28.0            | 39.0 | 28.1        | 39.2 | 0.2      |
| Merchant (SDG&E)       | 230         | 0               | 0    | 15.3        | 44.9 | 44.9     |
| Mesa                   | 230         | 15.4            | 47.3 | 15.6        | 49.6 | 2.3      |
| Mira Loma (A)          | 230         | 22.0            | 46.8 | 22.2        | 47.8 | 1.0      |
| Mira Loma (B)          | 230         | 24.4            | 52.9 | 24.5        | 54.0 | 1.1      |
| Olinda                 | 230         | 13.6            | 27.2 | 14.7        | 30.0 | 2.8      |
| Pardee                 | 230         | 15.9            | 54.7 | 15.9        | 55.1 | 0.4      |
| Rancho Vista           | 230         | 25.8            | 54.7 | 25.8        | 55.5 | 0.8      |
| Redondo                | 230         | 24.6            | 42.8 | 24.6        | 44.2 | 1.4      |
| Rio Hondo              | 230         | 14.5            | 30.8 | 14.5        | 31.3 | 0.5      |
| San Bernardino         | 230         | 18.6            | 36.8 | 18.4        | 37.3 | 0.5      |
| Serrano                | 230         | 26.3            | 56.5 | 26.4        | 57.2 | 0.7      |
| Sylmar (SCE)           | 230         | 15.3            | 60.1 | 15.3        | 60.4 | 0.3      |
| Villa Park             | 230         | 24.8            | 49.7 | 24.8        | 50.2 | 0.5      |
| Vincent                | 230         | 21.7            | 55.2 | 22.0        | 56.2 | 1.0      |
| Vista                  | 230         | 16.1            | 45.3 | 15.9        | 46.1 | 0.8      |
| Walnut                 | 230         | 13.3            | 28.6 | 15.9        | 34.9 | 6.3      |
| Altwind                | 115         | 8.8             | 16.1 | 8.8         | 16.6 | 0.5      |
| Devers                 | 115         | 19.1            | 24.4 | 20.1        | 25.7 | 1.3      |
| Garnet                 | 115         | 12.9            | 18.5 | 13.0        | 19.1 | 0.6      |
| Ivanpah                | 115         | 0               | 0    | 4.9         | 3.6  | 3.6      |
| Sanwind                | 115         | 8.4             | 13.3 | 8.5         | 14.0 | 0.7      |
| Tamarisk               | 115         | 7.3             | 13.6 | 7.3         | 13.9 | 0.3      |
| Terawind               | 115         | 12.0            | 20.2 | 12.1        | 21.0 | 0.8      |
| Tiffanywind            | 115         | 10.5            | 18.7 | 10.5        | 19.4 | 0.7      |
| Venwind                | 115         | 5.6             | 15.3 | 5.5         | 15.8 | 0.5      |

|          |    |      |      |      |      |     |
|----------|----|------|------|------|------|-----|
| Antelope | 66 | 25.6 | 34.1 | 26.1 | 34.4 | 0.3 |
| Windhub  | 66 | 58.1 | 13.1 | 58.9 | 13.4 | 0.3 |

Table H.3.1b

2012 System with Inclusion of Projects in 2013  
Three-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | Existing System |      | End of 2012 |      | Delta kA |
|------------------------|-------------|-----------------|------|-------------|------|----------|
|                        |             | X/R             | kA   | X/R         | kA   |          |
| Antelope               | 500         | 20.9            | 25.5 | 20.9        | 29.5 | 4.0      |
| Eldorado (Joint-Owned) | 500         | 13.4            | 41.3 | 13.4        | 41.5 | 0.2      |
| Lugo                   | 500         | 22.0            | 43.9 | 22.2        | 44.6 | 0.7      |
| Mira Loma              | 500         | 24.1            | 33.0 | 24.4        | 33.7 | 0.7      |
| Serrano                | 500         | 25.6            | 29.4 | 25.9        | 29.9 | 0.5      |
| Vincent                | 500         | 19.2            | 37.2 | 19.5        | 38.6 | 1.4      |
| Antelope               | 230         | 21.1            | 41.0 | 21.9        | 43.1 | 2.1      |
| Barre                  | 230         | 22.1            | 59.4 | 22.1        | 60.1 | 0.7      |
| Center                 | 230         | 14.8            | 40.2 | 14.9        | 41.4 | 1.2      |
| Chino                  | 230         | 15.1            | 36.5 | 15.0        | 37.0 | 0.5      |
| Del Amo                | 230         | 16.8            | 44.5 | 16.7        | 45.4 | 0.9      |
| Devers                 | 230         | 13.6            | 29.2 | 14.6        | 32.1 | 2.9      |
| El Casco               | 230         | 10.4            | 13.0 | 10.4        | 13.1 | 0.1      |
| El Nido                | 230         | 18.7            | 35.9 | 19.2        | 37.9 | 2.0      |
| El Segundo             | 230         | 18.6            | 31.2 | 19.5        | 33.3 | 2.1      |
| Eldorado (Joint-Owned) | 230         | 16.9            | 54.1 | 16.9        | 56.0 | 1.9      |
| Ellis                  | 230         | 17.7            | 43.1 | 17.6        | 43.3 | 0.2      |
| Etiwanda               | 230         | 25.5            | 53.9 | 25.5        | 54.7 | 0.8      |
| Hinson                 | 230         | 18.0            | 39.9 | 17.9        | 40.6 | 0.7      |
| Huntington Beach       | 230         | 14.7            | 31.0 | 14.7        | 31.1 | 0.1      |
| La Fresa               | 230         | 24.0            | 42.4 | 24.1        | 44.3 | 1.9      |
| Laguna Bell            | 230         | 15.6            | 34.5 | 15.5        | 35.0 | 0.5      |
| Lewis                  | 230         | 21.3            | 48.0 | 21.3        | 48.5 | 0.5      |
| Lighthipe              | 230         | 17.3            | 42.0 | 17.2        | 42.8 | 0.8      |
| Long Beach             | 230         | 12.4            | 27.1 | 12.3        | 27.4 | 0.3      |
| Lugo                   | 230         | 28.0            | 39.0 | 28.1        | 39.2 | 0.2      |
| Merchant (SDG&E)       | 230         | 0               | 0    | 15.3        | 44.9 | 44.9     |
| Mesa                   | 230         | 15.4            | 47.3 | 15.6        | 49.6 | 2.3      |
| Mira Loma (A)          | 230         | 22.0            | 46.8 | 22.2        | 47.8 | 1.0      |
| Mira Loma (B)          | 230         | 24.4            | 52.9 | 24.5        | 54.0 | 1.1      |
| Olinda                 | 230         | 13.6            | 27.2 | 14.7        | 30.0 | 2.8      |
| Pardee                 | 230         | 15.9            | 54.7 | 15.9        | 55.1 | 0.4      |
| Rancho Vista           | 230         | 25.8            | 54.7 | 25.8        | 55.5 | 0.8      |
| Redondo                | 230         | 24.6            | 42.8 | 24.6        | 44.2 | 1.4      |
| Rio Hondo              | 230         | 14.5            | 30.8 | 14.5        | 31.3 | 0.5      |
| San Bernardino         | 230         | 18.6            | 36.8 | 18.4        | 37.3 | 0.5      |
| Serrano                | 230         | 26.3            | 56.5 | 26.4        | 57.2 | 0.7      |
| Sylmar (SCE)           | 230         | 15.3            | 60.1 | 15.3        | 60.4 | 0.3      |
| Villa Park             | 230         | 24.8            | 49.7 | 24.8        | 50.2 | 0.5      |
| Vincent                | 230         | 21.7            | 55.2 | 22.0        | 56.2 | 1.0      |
| Vista                  | 230         | 16.1            | 45.3 | 15.9        | 46.1 | 0.8      |
| Walnut                 | 230         | 13.3            | 28.6 | 15.9        | 34.9 | 6.3      |
| Altwind                | 115         | 8.8             | 16.1 | 8.8         | 16.6 | 0.5      |
| Devers                 | 115         | 19.1            | 24.4 | 20.1        | 25.7 | 1.3      |
| Garnet                 | 115         | 12.9            | 18.5 | 13.0        | 19.1 | 0.6      |
| Ivanpah                | 115         | 0               | 0    | 4.9         | 3.6  | 3.6      |
| Sanwind                | 115         | 8.4             | 13.3 | 8.5         | 14.0 | 0.7      |
| Tamarisk               | 115         | 7.3             | 13.6 | 7.3         | 13.9 | 0.3      |
| Terawind               | 115         | 12.0            | 20.2 | 12.1        | 21.0 | 0.8      |
| Tiffanywind            | 115         | 10.5            | 18.7 | 10.5        | 19.4 | 0.7      |

|          |     |      |      |      |      |     |
|----------|-----|------|------|------|------|-----|
| Venwind  | 115 | 5.6  | 15.3 | 5.5  | 15.8 | 0.5 |
| Antelope | 66  | 25.6 | 34.1 | 26.1 | 34.4 | 0.3 |
| Windhub  | 66  | 58.1 | 13.1 | 58.9 | 13.4 | 0.3 |

Table H.3.2a  
2012 System with Inclusion of Projects in 2013  
Three-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | End of 2012 |      | End of 2013 |      | Delta kA |
|------------------------|-------------|-------------|------|-------------|------|----------|
|                        |             | X/R         | kA   | X/R         | kA   |          |
| Antelope               | 500         | 20.9        | 29.5 | 21.1        | 30.1 | 0.6      |
| Colorado River         | 500         | 0           | 0    | 18.7        | 13.5 | 13.5     |
| Eldorado (Joint-Owned) | 500         | 13.4        | 41.4 | 13.5        | 41.8 | 0.4      |
| Lugo                   | 500         | 22.2        | 44.6 | 22.2        | 45.3 | 0.7      |
| Mira Loma              | 500         | 24.4        | 33.7 | 24.4        | 34.3 | 0.6      |
| Red Bluff              | 500         | 0           | 0    | 18.7        | 14.9 | 14.9     |
| Serrano                | 500         | 25.9        | 29.9 | 25.9        | 31.0 | 1.1      |
| Vincent                | 500         | 19.5        | 38.6 | 19.7        | 39.2 | 0.6      |
| Antelope               | 230         | 21.9        | 43.1 | 21.7        | 43.8 | 0.7      |
| Barre                  | 230         | 22.1        | 60.1 | 22.1        | 60.5 | 0.4      |
| Chino                  | 230         | 15.0        | 37.0 | 17.6        | 48.2 | 11.2     |
| Colorado River         | 230         | 0           | 0    | 39.5        | 14.5 | 14.5     |
| Devers                 | 230         | 14.6        | 32.1 | 21.8        | 40.0 | 7.9      |
| Eldorado (Joint-Owned) | 230         | 16.9        | 55.9 | 17.3        | 57.7 | 1.8      |
| Ellis                  | 230         | 17.6        | 43.3 | 17.5        | 43.5 | 0.2      |
| Etiwanda               | 230         | 25.5        | 54.7 | 25.4        | 57.0 | 2.3      |
| Highwind               | 230         | 18.3        | 17.6 | 17.9        | 18.2 | 0.6      |
| Ivanpah                | 230         | 0           | 0    | 17.2        | 12.9 | 12.9     |
| Kramer                 | 230         | 14.8        | 16.1 | 16.5        | 19.0 | 2.9      |
| Lewis                  | 230         | 21.3        | 48.5 | 21.3        | 49.1 | 0.6      |
| Lugo                   | 230         | 28.1        | 39.2 | 27.4        | 39.9 | 0.7      |
| Mira Loma (A)          | 230         | 22.2        | 47.8 | 20.5        | 52.6 | 4.8      |
| Mira Loma (B)          | 230         | 24.5        | 54.0 | 24.0        | 61.0 | 7.0      |
| Mirage                 | 230         | 8.6         | 14.2 | 10.0        | 18.4 | 4.2      |
| Pardee                 | 230         | 15.9        | 55.1 | 15.9        | 55.3 | 0.2      |
| Rancho Vista           | 230         | 25.8        | 55.5 | 25.6        | 58.0 | 2.5      |
| Red Bluff              | 230         | 0           | 0    | 37.9        | 14.1 | 14.1     |
| San Onofre             | 230         | 30.2        | 45.0 | 30.2        | 45.2 | 0.2      |
| Serrano                | 230         | 26.4        | 57.2 | 26.6        | 58.3 | 1.1      |
| Sylmar (SCE)           | 230         | 15.3        | 60.4 | 15.3        | 60.5 | 0.1      |
| Villa Park             | 230         | 24.8        | 50.2 | 24.9        | 50.9 | 0.7      |
| Vincent                | 230         | 22.0        | 56.2 | 22.3        | 56.5 | 0.3      |
| Water Valley           | 230         | 0           | 0    | 18.8        | 12.8 | 12.8     |
| Farrell                | 115         | 6.2         | 11.1 | 10.1        | 13.2 | 2.1      |
| Ivanpah                | 115         | 4.9         | 3.6  | 15.5        | 15.9 | 12.3     |
| Kramer                 | 115         | 11.9        | 24.2 | 12.4        | 25.3 | 1.1      |
| Antelope               | 66          | 26.1        | 34.4 | 19.2        | 36.7 | 2.3      |
| Del Sur                | 66          | 7.8         | 14.2 | 7.5         | 21.0 | 6.8      |
| Goldtown               | 66          | 3.7         | 4.9  | 5.2         | 9.5  | 4.6      |
| Great Lakes            | 66          | 2.8         | 3.5  | 2.8         | 3.7  | 0.2      |
| Oasis                  | 66          | 5.4         | 9.4  | 5.1         | 9.6  | 0.2      |
| Quartz Hill            | 66          | 9.5         | 17.9 | 8.6         | 18.6 | 0.7      |
| Ritter Ranch           | 66          | 7.5         | 11.9 | 7.1         | 12.2 | 0.3      |
| Rosamond               | 66          | 3.5         | 7.3  | 3.4         | 8.1  | 0.8      |
| Windhub                | 66          | 58.9        | 13.4 | 23.6        | 24.9 | 11.5     |



Table H.3.2b  
 2012 System with Inclusion of Projects in 2013  
 Single-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | End of 2012 |      | End of 2013 |      | Delta kA |
|------------------------|-------------|-------------|------|-------------|------|----------|
|                        |             | X/R         | kA   | X/R         | kA   |          |
| Antelope               | 500         | 18.7        | 25.4 | 18.7        | 25.7 | 0.3      |
| Colorado River         | 500         | 0           | 0    | 13.2        | 11.1 | 11.1     |
| Lugo                   | 500         | 11.9        | 35.2 | 11.9        | 35.5 | 0.3      |
| Mira Loma              | 500         | 12.2        | 30.9 | 12.2        | 31.4 | 0.5      |
| Red Bluff              | 500         | 0           | 0    | 11.8        | 12.7 | 12.7     |
| Serrano                | 500         | 14.3        | 26.9 | 14.0        | 27.5 | 0.6      |
| Vincent                | 500         | 16.1        | 32.4 | 16.1        | 32.7 | 0.3      |
| Antelope               | 230         | 22.8        | 46.6 | 22.6        | 47.2 | 0.6      |
| Barre                  | 230         | 13.1        | 48.5 | 13.1        | 48.7 | 0.2      |
| Chino                  | 230         | 11.6        | 32.8 | 12.6        | 41.6 | 8.8      |
| Colorado River         | 230         | 0           | 0    | 27.0        | 15.7 | 15.7     |
| Devers                 | 230         | 14.6        | 35.8 | 18.8        | 46.3 | 10.5     |
| Eldorado (Joint-Owned) | 230         | 14.6        | 51.8 | 14.7        | 53.2 | 1.4      |
| Etiwanda               | 230         | 18.1        | 55.4 | 17.8        | 57.1 | 1.7      |
| Highwind               | 230         | 9.0         | 11.4 | 8.9         | 11.6 | 0.2      |
| Ivanpah                | 230         | 0           | 0    | 13.9        | 9.1  | 9.1      |
| Kramer                 | 230         | 10.2        | 13.4 | 9.8         | 16.0 | 2.6      |
| Lewis                  | 230         | 15.4        | 44.9 | 15.3        | 45.2 | 0.3      |
| Lugo                   | 230         | 22.7        | 40.1 | 22.3        | 40.6 | 0.5      |
| Mira Loma (A)          | 230         | 15.7        | 49.5 | 14.7        | 52.9 | 3.4      |
| Mira Loma (B)          | 230         | 16.0        | 53.7 | 16.0        | 59.6 | 5.9      |
| Mirage                 | 230         | 8.4         | 13.6 | 10.5        | 16.4 | 2.8      |
| Rancho Vista           | 230         | 18.5        | 57.5 | 18.2        | 59.4 | 1.9      |
| Red Bluff              | 230         | 0           | 0    | 26.1        | 15.7 | 15.7     |
| Serrano                | 230         | 19.3        | 58.8 | 19.2        | 59.6 | 0.8      |
| Villa Park             | 230         | 17.5        | 44.4 | 17.4        | 44.8 | 0.4      |
| Vincent                | 230         | 19.1        | 56.8 | 19.3        | 57.1 | 0.3      |
| Vista                  | 230         | 13.6        | 40.8 | 13.2        | 41.1 | 0.3      |
| Water Valley           | 230         | 0           | 0    | 15.6        | 13.0 | 13       |
| Windhub                | 230         | 29.5        | 38.6 | 28.3        | 40.2 | 1.6      |
| Farrell                | 115         | 7.0         | 10.2 | 9.8         | 12.5 | 2.3      |
| Garnet                 | 115         | 11.6        | 16.3 | 14.1        | 16.5 | 0.2      |
| Ivanpah                | 115         | 5.6         | 4.1  | 14.9        | 16.7 | 12.6     |
| Kramer                 | 115         | 11.7        | 22.8 | 11.4        | 24.1 | 1.3      |
| Valley                 | 115         | 46.9        | 24.8 | 49.1        | 25.6 | 0.8      |
| Victor                 | 115         | 18.3        | 24.7 | 18.2        | 24.8 | 0.1      |
| Antelope               | 66          | 22.1        | 22.9 | 18.3        | 23.8 | 0.9      |
| Windhub                | 66          | 22.1        | 11.2 | 17.8        | 19.1 | 7.9      |

Table H.3.3a  
 2013 System with Inclusion of Projects in 2014  
 Three-Phase-to-Ground Fault Analysis

| Substation Name | Bus Voltage | End of 2013 |      | End of 2014 |      | Delta kA |
|-----------------|-------------|-------------|------|-------------|------|----------|
|                 |             | X/R         | kA   | X/R         | kA   |          |
| Antelope        | 500         | 21.1        | 30.1 | 21.6        | 31.8 | 1.7      |
| Lugo            | 500         | 22.2        | 45.3 | 22.2        | 45.7 | 0.4      |
| Mira Loma       | 500         | 24.4        | 34.3 | 24.1        | 37.4 | 3.1      |
| Serrano         | 500         | 25.9        | 31.0 | 25.7        | 31.9 | 0.9      |
| Vincent         | 500         | 19.7        | 39.2 | 20.1        | 42.5 | 3.3      |
| Antelope        | 230         | 21.7        | 43.8 | 22.9        | 44.5 | 0.7      |
| Barre           | 230         | 22.1        | 60.5 | 22.1        | 60.8 | 0.3      |
| Chino           | 230         | 17.6        | 48.2 | 17.6        | 49.2 | 1.0      |
| Etiwanda        | 230         | 25.4        | 57.0 | 25.4        | 57.9 | 0.9      |
| Highwind        | 230         | 17.9        | 18.2 | 18.1        | 18.8 | 0.6      |
| Lewis           | 230         | 21.3        | 49.1 | 21.3        | 49.4 | 0.3      |
| Mira Loma (A)   | 230         | 20.5        | 52.6 | 20.7        | 54.0 | 1.4      |
| Mira Loma (B)   | 230         | 24.0        | 61.0 | 24.2        | 62.7 | 1.7      |
| Rancho Vista    | 230         | 25.6        | 58   | 25.6        | 59.0 | 1.0      |
| San Bernardino  | 230         | 20.1        | 36.5 | 20.0        | 36.7 | 0.2      |
| Serrano         | 230         | 26.6        | 58.3 | 26.6        | 59   | 0.7      |
| Villa Park      | 230         | 24.9        | 50.9 | 24.9        | 51.4 | 0.5      |
| Vincent         | 230         | 22.3        | 56.5 | 23.1        | 58   | 1.5      |
| Vista           | 230         | 16.3        | 45.8 | 16.2        | 46.3 | 0.5      |
| Cal Cement      | 66          | 5.3         | 6.1  | 17.8        | 18.9 | 12.8     |
| Canwind         | 66          | 5.5         | 5.0  | 9.3         | 11.0 | 6.0      |
| Enwind          | 66          | 5.5         | 5.0  | 9.3         | 11.0 | 6.0      |
| Great Lakes     | 66          | 2.8         | 3.7  | 2.9         | 5.9  | 2.2      |
| Southwind       | 66          | 5.1         | 4.3  | 7.2         | 7.8  | 3.5      |
| Windhub         | 66          | 23.6        | 24.9 | 43.2        | 25.5 | 0.6      |



Table H.3.3b  
 2013 System with Inclusion of Projects in 2014  
 Single-Phase-to-Ground Fault Analysis

| Substation Name | Bus Voltage | End of 2013 |      | End of 2014 |      | Delta kA |
|-----------------|-------------|-------------|------|-------------|------|----------|
|                 |             | X/R         | kA   | X/R         | kA   |          |
| Antelope        | 500         | 18.7        | 25.7 | 18.5        | 27.0 | 1.3      |
| Lugo            | 500         | 11.9        | 35.5 | 11.8        | 35.7 | 0.2      |
| Mira Loma       | 500         | 12.2        | 31.4 | 11.7        | 34.0 | 2.6      |
| Serrano         | 500         | 14.0        | 27.5 | 13.8        | 28.0 | 0.5      |
| Vincent         | 500         | 16.1        | 32.7 | 15.3        | 35.4 | 2.7      |
| Antelope        | 230         | 22.6        | 47.2 | 23.4        | 47.9 | 0.7      |
| Barre           | 230         | 13.1        | 48.7 | 13.1        | 48.8 | 0.1      |
| Chino           | 230         | 12.6        | 41.6 | 12.4        | 42.2 | 0.6      |
| Etiwanda        | 230         | 17.8        | 57.1 | 17.6        | 57.7 | 0.6      |
| Highwind        | 230         | 8.9         | 11.6 | 8.8         | 11.8 | 0.2      |
| Lewis           | 230         | 15.3        | 45.2 | 15.3        | 45.4 | 0.2      |
| Mira Loma (A)   | 230         | 14.7        | 52.9 | 14.2        | 54.3 | 1.4      |
| Mira Loma (B)   | 230         | 16.0        | 59.6 | 16.6        | 61.0 | 1.4      |
| Rancho Vista    | 230         | 18.2        | 59.4 | 17.9        | 60.1 | 0.7      |
| San Bernardino  | 230         | 18.5        | 38.6 | 18.4        | 38.8 | 0.2      |
| Serrano         | 230         | 19.2        | 59.6 | 19.1        | 60.1 | 0.5      |
| Villa Park      | 230         | 17.4        | 44.8 | 17.4        | 45.0 | 0.2      |
| Vincent         | 230         | 19.3        | 57.1 | 19.7        | 58.6 | 1.5      |
| Vista           | 230         | 13.2        | 41.1 | 13.1        | 41.4 | 0.3      |
| Windhub         | 220         | 28.3        | 40.2 | 30.2        | 42.4 | 2.2      |
| Cal Cement      | 66          | 5.5         | 3.0  | 9.5         | 11.9 | 8.9      |
| Canwind         | 66          | 5.6         | 2.3  | 7.6         | 5.9  | 3.6      |
| Enwind          | 66          | 5.6         | 2.3  | 7.6         | 5.9  | 3.6      |
| Great Lakes     | 66          | 3.9         | 2.0  | 4.1         | 3.3  | 1.3      |
| Southwind       | 66          | 5.5         | 2.2  | 6.8         | 4.3  | 2.1      |
| Windhub         | 66          | 17.8        | 19.1 | 21.5        | 19.5 | 0.4      |

Table H.3.4a  
 2014 System with Inclusion of Projects Beyond 2014 and All Other Generation as E/O  
 Three-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | End of 2014 |      | Beyond 2014 & E/O |      | Delta kA |
|------------------------|-------------|-------------|------|-------------------|------|----------|
|                        |             | X/R         | kA   | X/R               | kA   |          |
| Alberhill              | 500         | 0           | 0    | 27.4              | 19.6 | 19.6     |
| Antelope               | 500         | 21.6        | 31.8 | 23.5              | 35.9 | 4.1      |
| Colorado River         | 500         | 18.7        | 13.5 | 25.5              | 20.9 | 7.4      |
| Eldorado (Joint-Owned) | 500         | 13.5        | 41.9 | 13.9              | 44.7 | 2.8      |
| Lugo                   | 500         | 22.2        | 45.7 | 22.6              | 48.3 | 2.6      |
| Mira Loma              | 500         | 24.1        | 37.4 | 24.5              | 38.9 | 1.5      |
| Red Bluff              | 500         | 18.7        | 14.9 | 23.2              | 21.0 | 6.1      |
| Serrano                | 500         | 25.7        | 31.9 | 26.3              | 33.5 | 1.6      |
| Vincent                | 500         | 20.1        | 42.5 | 21.3              | 47.5 | 5.0      |
| Antelope               | 230         | 22.9        | 44.5 | 24.8              | 50.1 | 5.6      |
| Center                 | 230         | 14.9        | 41.5 | 14.9              | 41.8 | 0.3      |
| Chino                  | 230         | 17.6        | 49.2 | 17.8              | 49.7 | 0.5      |
| Colorado River         | 230         | 39.5        | 14.5 | 51.9              | 35.5 | 21       |
| Del Amo                | 230         | 16.7        | 45.5 | 16.8              | 45.9 | 0.4      |
| Devers                 | 230         | 21.8        | 40.0 | 23.4              | 44.0 | 4.0      |
| El Nido                | 230         | 19.2        | 37.9 | 19.8              | 39.2 | 1.3      |
| El Segundo             | 230         | 19.5        | 33.3 | 20.4              | 34.6 | 1.3      |
| Eldorado (Joint-Owned) | 230         | 17.3        | 57.7 | 16.7              | 58.0 | 0.3      |
| Etiwanda               | 230         | 25.4        | 57.9 | 25.6              | 59.0 | 1.1      |
| Highwind               | 230         | 18.1        | 18.8 | 18.0              | 21.5 | 2.7      |
| Hinson                 | 230         | 17.9        | 40.6 | 18.1              | 41.6 | 1.0      |
| Jasper                 | 230         | 0           | 0    | 11.9              | 10.3 | 10.3     |
| Kramer                 | 230         | 16.5        | 19.0 | 16.6              | 19.9 | 0.9      |
| La Fresa               | 230         | 24.1        | 44.3 | 24.6              | 45.6 | 1.3      |
| Laguna Bell            | 230         | 15.6        | 35.1 | 15.6              | 35.4 | 0.3      |
| Lewis                  | 230         | 21.3        | 49.4 | 21.8              | 49.8 | 0.4      |
| Lighthipe              | 230         | 17.2        | 42.9 | 17.2              | 43.5 | 0.6      |
| Long Beach             | 230         | 12.3        | 27.4 | 12.3              | 27.8 | 0.4      |
| Lugo                   | 230         | 27.5        | 40.0 | 26.1              | 43.2 | 3.2      |
| Merchant (SDG&E)       | 230         | 15.5        | 46.0 | 15.1              | 46.2 | 0.2      |
| Mesa                   | 230         | 15.6        | 49.7 | 15.6              | 50.5 | 0.8      |
| Mira Loma (A)          | 230         | 20.7        | 54.0 | 21.0              | 54.8 | 0.8      |
| Mira Loma (B)          | 230         | 24.2        | 62.7 | 24.5              | 64.0 | 1.3      |
| Mirage                 | 230         | 10.0        | 18.4 | 9.9               | 19.0 | 0.6      |
| Moorpark               | 230         | 20.2        | 34.7 | 20.1              | 34.9 | 0.2      |
| Olinda                 | 230         | 14.7        | 30.2 | 14.7              | 30.4 | 0.2      |
| Pardee                 | 230         | 15.9        | 55.4 | 15.9              | 56.2 | 0.8      |
| Pastoria               | 230         | 13.4        | 30.3 | 13.3              | 30.5 | 0.2      |
| Rancho Vista           | 230         | 25.6        | 59.0 | 25.8              | 60.1 | 1.1      |
| Red Bluff              | 230         | 37.9        | 14.1 | 46.7              | 22.1 | 8.0      |
| Redondo                | 230         | 24.6        | 44.2 | 24.8              | 45.1 | 0.9      |
| Rio Hondo              | 230         | 14.8        | 31.4 | 14.8              | 31.8 | 0.4      |
| San Bernardino         | 230         | 20.0        | 36.7 | 19.9              | 37.1 | 0.4      |
| Serrano                | 230         | 26.6        | 59.0 | 27.8              | 59.7 | 0.7      |
| Sylmar (SCE)           | 230         | 15.3        | 60.5 | 15.3              | 61.1 | 0.6      |
| Victor                 | 230         | 15.6        | 24.0 | 15.1              | 25.2 | 1.2      |
| Villa Park             | 230         | 24.9        | 51.4 | 25.6              | 51.8 | 0.4      |
| Vincent                | 230         | 23.1        | 58.0 | 24.4              | 64.1 | 6.1      |
| Vista                  | 230         | 16.2        | 46.3 | 16.3              | 47.2 | 0.9      |
| Walnut                 | 230         | 15.9        | 35.0 | 15.9              | 35.3 | 0.3      |
| Water Valley           | 230         | 18.8        | 12.8 | 18.7              | 13.0 | 0.2      |
| Whirlwind              | 230         | 40.2        | 30.6 | 47.9              | 43.4 | 12.8     |

|         |     |      |      |      |      |     |
|---------|-----|------|------|------|------|-----|
| Windhub | 230 | 30.0 | 36.3 | 32.1 | 46.1 | 9.8 |
|---------|-----|------|------|------|------|-----|

Table H.3.4a

2014 System with Inclusion of Projects Beyond 2014 and All Other Generation as E/O

Three-Phase-to-Ground Fault Analysis

(Continued)

| Substation Name | Bus Voltage | End of 2014 |      | Beyond 2014 & E/O |      | Delta kA |
|-----------------|-------------|-------------|------|-------------------|------|----------|
|                 |             | X/R         | kA   | X/R               | kA   |          |
| Altwind         | 115         | 11.3        | 16.0 | 10.9              | 17.0 | 1.0      |
| Devers          | 115         | 40.9        | 24.3 | 43.0              | 26.8 | 2.5      |
| Ferrell         | 115         | 10.1        | 13.2 | 9.7               | 13.9 | 0.7      |
| Garnet          | 115         | 18.1        | 18.0 | 17.4              | 19.3 | 1.3      |
| Kramer          | 115         | 12.4        | 25.3 | 12.3              | 25.7 | 0.4      |
| Sanwind         | 115         | 9.8         | 13.6 | 9.5               | 14.5 | 0.9      |
| Terawind        | 115         | 16.6        | 20.1 | 16.2              | 21.8 | 1.7      |
| Tiffanywind     | 115         | 14.0        | 18.4 | 13.6              | 19.8 | 1.4      |
| Venwind         | 115         | 6.2         | 15.3 | 6.3               | 16.3 | 1.0      |
| Antelope        | 66          | 29.4        | 34.2 | 28.1              | 39.3 | 5.1      |
| Cal Cement      | 66          | 17.8        | 18.9 | 17.3              | 20.1 | 1.2      |
| Canwind         | 66          | 9.3         | 11.0 | 9.1               | 11.4 | 0.4      |
| Del Sur         | 66          | 8.7         | 19.8 | 8.7               | 22.6 | 2.8      |
| Enwind          | 66          | 9.3         | 11.0 | 9.1               | 11.4 | 0.4      |
| Goldtown        | 66          | 7.5         | 8.8  | 7.6               | 9.3  | 0.5      |
| Great Lakes     | 66          | 2.9         | 5.9  | 2.9               | 6.4  | 0.5      |
| Oasis           | 66          | 5.5         | 9.4  | 5.5               | 10.3 | 0.9      |
| Quartz Hill     | 66          | 9.7         | 17.8 | 9.3               | 19.4 | 1.6      |
| Ritter Ranch    | 66          | 7.6         | 11.8 | 7.3               | 12.6 | 0.8      |
| Rosamond        | 66          | 3.5         | 8.0  | 3.6               | 9.2  | 1.2      |
| Southwind       | 66          | 7.2         | 7.8  | 7.1               | 8.0  | 0.2      |
| Windhub         | 66          | 43.2        | 25.5 | 45.9              | 27.9 | 2.4      |

Table H.3.4b  
 2014 System with Inclusion of Projects Beyond 2014 and All Other Generation as E/O  
 Single-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | End of 2014 |      | Beyond 2014 & E/O |      | Delta kA |
|------------------------|-------------|-------------|------|-------------------|------|----------|
|                        |             | X/R         | kA   | X/R               | kA   |          |
| Alberhill              | 500         | 0           | 0    | 11.7              | 18.3 | 18.3     |
| Antelope               | 500         | 18.5        | 27.0 | 19.1              | 29.6 | 2.6      |
| Colorado River         | 500         | 13.2        | 11.1 | 19.8              | 18.9 | 7.8      |
| Eldorado (Joint-Owned) | 500         | 11.0        | 33.9 | 12.1              | 38.5 | 4.6      |
| Lugo                   | 500         | 11.8        | 35.7 | 11.7              | 37.1 | 1.4      |
| Mira Loma              | 500         | 11.7        | 34.0 | 11.5              | 34.9 | 0.9      |
| Red Bluff              | 500         | 11.8        | 12.8 | 13.4              | 17.7 | 4.9      |
| Serrano                | 500         | 13.8        | 28.0 | 13.2              | 29.4 | 1.4      |
| Vincent                | 500         | 15.3        | 35.4 | 15.5              | 38.2 | 2.8      |
| Antelope               | 230         | 23.4        | 47.9 | 24.9              | 53.7 | 5.8      |
| Center                 | 230         | 14.8        | 34.0 | 14.8              | 34.1 | 0.1      |
| Chino                  | 230         | 12.4        | 42.2 | 12.5              | 42.4 | 0.2      |
| Colorado River         | 230         | 27.0        | 15.7 | 29.4              | 39.3 | 23.6     |
| Del Amo                | 230         | 10.4        | 40.6 | 10.4              | 40.8 | 0.2      |
| Devers                 | 230         | 18.8        | 46.4 | 19.8              | 50.0 | 3.6      |
| El Nido                | 230         | 17.5        | 37.2 | 17.6              | 38.3 | 1.1      |
| El Segundo             | 230         | 18.9        | 32.8 | 20.5              | 34.9 | 2.1      |
| Eldorado (Joint-Owned) | 230         | 14.7        | 53.2 | 14.8              | 54.1 | 0.9      |
| Etiwanda               | 230         | 17.6        | 57.7 | 17.6              | 58.5 | 0.8      |
| Highwind               | 230         | 8.8         | 11.8 | 12.6              | 16.1 | 4.3      |
| Hinson                 | 230         | 19.6        | 36.4 | 19.8              | 36.9 | 0.5      |
| Jasper                 | 230         | 0           | 0    | 9.8               | 7.6  | 7.6      |
| Kramer                 | 230         | 9.8         | 16.0 | 9.4               | 16.9 | 0.9      |
| La Fresa               | 230         | 20.6        | 42.5 | 20.7              | 43.3 | 0.8      |
| Laguna Bell            | 230         | 12.9        | 32.6 | 12.9              | 32.8 | 0.2      |
| Lewis                  | 230         | 15.3        | 45.4 | 15.4              | 45.6 | 0.2      |
| Lighthipe              | 230         | 11.7        | 39.5 | 11.7              | 39.8 | 0.3      |
| Water Valley           | 230         | 15.6        | 13.0 | 15.3              | 13.2 | 0.2      |
| Lugo                   | 230         | 22.3        | 40.6 | 21.1              | 43.3 | 2.7      |
| Merchant (SDG&E)       | 230         | 10.6        | 38.0 | 10.6              | 38.5 | 0.5      |
| Mesa                   | 230         | 11.4        | 41.7 | 11.3              | 42.1 | 0.4      |
| Mira Loma (A)          | 230         | 14.2        | 54.3 | 14.2              | 54.8 | 0.5      |
| Mira Loma (B)          | 230         | 16.6        | 61.0 | 16.6              | 61.8 | 0.8      |
| Mirage                 | 230         | 10.5        | 16.4 | 10.5              | 16.7 | 0.3      |
| Pardee                 | 230         | 13.9        | 40.5 | 13.9              | 40.8 | 0.3      |
| Pastoria               | 230         | 13.4        | 27.5 | 13.3              | 27.6 | 0.1      |
| Rancho Vista           | 230         | 17.9        | 60.1 | 17.9              | 60.9 | 0.8      |
| Red Bluff              | 230         | 26.0        | 15.7 | 29.0              | 25.0 | 9.3      |
| Redondo                | 230         | 30.8        | 40.5 | 31.0              | 41.0 | 0.5      |
| Rio Hondo              | 230         | 16.3        | 26.7 | 16.3              | 26.9 | 0.2      |
| San Bernardino         | 230         | 18.4        | 38.8 | 18.3              | 39.1 | 0.3      |
| Serrano                | 230         | 19.1        | 60.1 | 18.9              | 61.2 | 1.1      |
| Sylmar (SCE)           | 230         | 12.6        | 66.7 | 12.6              | 67.1 | 0.4      |
| Villa Park             | 230         | 17.4        | 45.0 | 17.4              | 45.4 | 0.4      |
| Vincent                | 230         | 19.7        | 58.6 | 20.2              | 63.7 | 5.1      |
| Vista                  | 230         | 13.1        | 41.4 | 13.1              | 41.9 | 0.5      |
| Walnut                 | 230         | 16.7        | 33.6 | 16.7              | 33.7 | 0.1      |
| Whirlwind              | 230         | 32.2        | 34.5 | 33.9              | 49.6 | 15.1     |
| Windhub                | 230         | 30.2        | 42.4 | 30.2              | 52.5 | 10.1     |

Table H.3.4b  
 2014 System with Inclusion of Projects Beyond 2014 and All Other Generation as E/O  
 Single-Phase-to-Ground Fault Analysis  
 (Continued)

| Substation Name | Bus Voltage | End of 2014 |      | Beyond 2014 & E/O |      | Delta kA |
|-----------------|-------------|-------------|------|-------------------|------|----------|
|                 |             | X/R         | kA   | X/R               | kA   |          |
| Altwind         | 115         | 9.2         | 13.4 | 9.0               | 14.0 | 0.6      |
| Devers          | 115         | 36.0        | 28.0 | 37.8              | 30.7 | 2.7      |
| Ferrell         | 115         | 9.8         | 12.5 | 9.6               | 12.9 | 0.4      |
| Garnet          | 115         | 14.0        | 16.5 | 13.7              | 17.2 | 0.7      |
| Kramer          | 115         | 11.4        | 24.1 | 11.3              | 24.5 | 0.4      |
| Terawind        | 115         | 12.6        | 19.1 | 12.3              | 20.4 | 1.3      |
| Tiffanywind     | 115         | 10.9        | 16.7 | 10.6              | 17.7 | 1.0      |
| Victor          | 115         | 18.2        | 24.8 | 17.4              | 26.4 | 1.6      |
| Antelope        | 66          | 22.8        | 22.7 | 21.4              | 24.8 | 2.1      |
| Cal Cement      | 66          | 9.5         | 11.9 | 9.3               | 12.2 | 0.3      |
| Great Lakes     | 66          | 4.1         | 3.3  | 4.1               | 3.5  | 0.2      |
| Ritter Ranch    | 66          | 9.0         | 5.4  | 8.8               | 5.6  | 0.2      |
| Windhub         | 66          | 21.5        | 19.5 | 21.3              | 20.4 | 0.9      |

Table H.3.5a  
System with all Projects Beyond 2014 and all Delivery Network Upgrades  
Three-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | Beyond 2014 & E/O |      | All Delivery Upgrades |      | Delta kA |
|------------------------|-------------|-------------------|------|-----------------------|------|----------|
|                        |             | X/R               | kA   | X/R                   | kA   |          |
| Antelope               | 500         | 21.6              | 31.8 | 22.9                  | 39.8 | 8.0      |
| Colorado River         | 500         | 18.7              | 13.5 | 26.7                  | 23.7 | 10.2     |
| Eldorado (Joint-Owned) | 500         | 13.5              | 41.9 | 14.0                  | 46.4 | 4.5      |
| Lugo                   | 500         | 22.2              | 45.7 | 22.3                  | 47.8 | 2.1      |
| Mira Loma              | 500         | 24.1              | 37.4 | 24.1                  | 39.4 | 2.0      |
| Red Bluff              | 500         | 18.7              | 14.9 | 23.6                  | 23.1 | 8.2      |
| Serrano                | 500         | 25.7              | 31.9 | 25.1                  | 32.7 | 0.8      |
| Vincent                | 500         | 20.1              | 42.5 | 20.1                  | 51.6 | 9.1      |
| Center                 | 230         | 14.9              | 41.5 | 14.4                  | 42.2 | 0.7      |
| Chino                  | 230         | 17.6              | 49.2 | 16.2                  | 50.9 | 1.7      |
| Colorado River         | 230         | 39.5              | 14.5 | 40.9                  | 44.7 | 30.2     |
| Devers                 | 230         | 21.8              | 40.0 | 27.0                  | 50.6 | 10.6     |
| El Nido                | 230         | 19.2              | 37.9 | 18.1                  | 39.7 | 1.8      |
| El Segundo             | 230         | 19.5              | 33.3 | 18.7                  | 35.1 | 1.8      |
| Hinson                 | 230         | 17.9              | 40.6 | 17.7                  | 43.1 | 2.5      |
| Kramer                 | 230         | 16.5              | 19.0 | 14.8                  | 20.8 | 1.8      |
| La Fresa               | 230         | 24.1              | 44.3 | 22.4                  | 46.3 | 2.0      |
| Laguna Bell            | 230         | 15.6              | 35.1 | 14.8                  | 36.0 | 0.9      |
| Lighthipe              | 230         | 17.2              | 42.9 | 16.9                  | 45.0 | 2.1      |
| Water Valley           | 230         | 18.8              | 12.8 | 17.0                  | 13.9 | 1.1      |
| Lugo                   | 230         | 27.5              | 40.0 | 29.8                  | 42.2 | 2.2      |
| Merchant (SDG&E)       | 230         | 16.7              | 50.0 | 17.4                  | 52.2 | 2.2      |
| Mesa                   | 230         | 15.6              | 49.7 | 15.9                  | 54.6 | 4.9      |
| Mira Loma (A)          | 230         | 20.7              | 54.0 | 20.2                  | 54.4 | 0.4      |
| Olinda                 | 230         | 14.7              | 30.2 | 14.6                  | 31.3 | 1.1      |
| Pardee                 | 230         | 15.9              | 55.4 | 15.4                  | 61.3 | 5.9      |
| Red Bluff              | 230         | 37.9              | 14.1 | 39.9                  | 30.1 | 16.0     |
| Redondo                | 230         | 24.6              | 44.2 | 23.2                  | 45.8 | 1.6      |
| Rio Hondo              | 230         | 14.8              | 31.4 | 14.6                  | 32.1 | 0.7      |
| Sylmar (SCE)           | 230         | 15.3              | 60.5 | 15.2                  | 63.0 | 2.5      |
| Vincent                | 230         | 23.1              | 58.0 | 22.5                  | 68.3 | 10.3     |
| Vista                  | 230         | 16.2              | 46.3 | 21.0                  | 49.3 | 3.0      |
| Walnut                 | 230         | 15.9              | 35.0 | 15.8                  | 37.0 | 2.0      |
| Whirlwind              | 230         | 40.2              | 30.6 | 41.2                  | 50.3 | 19.7     |
| Antelope               | 66          | 29.4              | 34.2 | 44.3                  | 39.7 | 5.5      |
| Del Sur                | 66          | 8.7               | 19.8 | 12.0                  | 26.8 | 7.0      |
| Oasis                  | 66          | 5.5               | 9.4  | 6.1                   | 11.9 | 2.5      |
| Quartz Hill            | 66          | 9.7               | 17.8 | 10.0                  | 19.7 | 1.9      |
| Ritter Ranch           | 66          | 7.6               | 11.8 | 7.7                   | 12.7 | 0.9      |
| Rosamond               | 66          | 3.5               | 8.0  | 3.9                   | 9.8  | 1.8      |

Table H.3.5b  
 System with all Projects Beyond 2014 and all Delivery Network Upgrades  
 Single-Phase-to-Ground Fault Analysis

| Substation Name        | Bus Voltage | Beyond 2014 & E/O |      | All Delivery Upgrades |      | Delta kA |
|------------------------|-------------|-------------------|------|-----------------------|------|----------|
|                        |             | X/R               | kA   | X/R                   | kA   |          |
| Antelope               | 500         | 18.5              | 27.0 | 18.0                  | 33.4 | 6.4      |
| Colorado River         | 500         | 13.2              | 11.1 | 23.8                  | 24.6 | 13.5     |
| Eldorado (Joint-Owned) | 500         | 11.0              | 33.9 | 12.7                  | 41.5 | 7.6      |
| Lugo                   | 500         | 11.8              | 35.7 | 12.3                  | 36.3 | 0.6      |
| Red Bluff              | 500         | 11.8              | 12.8 | 14.9                  | 20.8 | 8.0      |
| Vincent                | 500         | 15.3              | 35.4 | 14.8                  | 40.4 | 5.0      |
| Colorado River         | 230         | 27.0              | 15.7 | 32.0                  | 52.2 | 36.5     |
| Devers                 | 230         | 18.8              | 46.4 | 25.4                  | 55.4 | 9.0      |
| El Nido                | 230         | 17.5              | 37.2 | 16.7                  | 38.7 | 1.5      |
| El Segundo             | 230         | 18.9              | 32.8 | 19.3                  | 35.2 | 2.4      |
| Hinson                 | 230         | 19.6              | 36.4 | 19.5                  | 37.7 | 1.3      |
| Kramer                 | 230         | 9.8               | 16.0 | 10.4                  | 18.1 | 2.1      |
| La Fresa               | 230         | 20.6              | 42.5 | 19.6                  | 43.7 | 1.2      |
| Lighthipe              | 230         | 11.7              | 39.5 | 11.5                  | 40.7 | 1.2      |
| Water Valley           | 230         | 15.6              | 13.0 | 14.4                  | 13.9 | 0.9      |
| Lugo                   | 230         | 22.3              | 40.6 | 23.1                  | 42.4 | 1.8      |
| Merchant (SDG&E)       | 230         | 14.4              | 46.0 | 14.3                  | 46.8 | 0.8      |
| Mesa                   | 230         | 11.4              | 41.7 | 11                    | 44.7 | 3.0      |
| Pardee                 | 230         | 13.9              | 40.5 | 14.3                  | 45.9 | 5.4      |
| Red Bluff              | 230         | 26.0              | 15.7 | 27.3                  | 33.8 | 18.1     |
| Redondo                | 230         | 30.8              | 40.5 | 29.5                  | 41.4 | 0.9      |
| Sylmar (SCE)           | 230         | 12.6              | 66.7 | 12.5                  | 68.6 | 1.9      |
| Vincent                | 230         | 19.7              | 58.6 | 19.6                  | 66.5 | 7.9      |
| Whirlwind              | 230         | 32.2              | 34.5 | 31.5                  | 58.6 | 24.1     |
| Victor                 | 115         | 18.2              | 24.8 | 17.9                  | 26.5 | 1.7      |
| Antelope               | 66          | 22.8              | 22.7 | 26.9                  | 24.1 | 1.4      |
| Ritter Ranch           | 66          | 9.0               | 5.4  | 9.1                   | 5.6  | 0.2      |



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT  
COMMISSION OF THE STATE OF CALIFORNIA  
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**APPLICATION FOR CERTIFICATION FOR THE  
RIO MESA SOLAR ELECTRIC  
GENERATING FACILITY**

DOCKET NO. 11-AFC-04  
PROOF OF SERVICE  
(Revised 11/2/12)

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DECLARATION OF SERVICE

I, Kwame Thompson, declare that on December 11, 2012, I served a copy of the attached document Technical Appendices for the Phase II CAISO study of the Eastern Bulk Power System. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: <http://www.energy.ca.gov/sitingcases/riomesa/index.html>.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

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- Served electronically to all e-mail addresses on the Proof of Service list;
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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original Signed by:  
Kwame Thompson