

**Southwest Minnesota “EHV” study faults.**

| identifier | mnemonic | run on 31a | run on sb2 | run on sa2 | disturbance description  |
|------------|----------|------------|------------|------------|--|
| 1          | ag1      | 1          | 1          | 1          | 4 cycle slgf @ Leland Olds 345 on Ft. Thompson line, Leland Olds breaker 2692 stuck. Clear @ 11 cycles by tripping faulted line.                         |
| 2          | ei2      | 1          | 1          | 1          | Permanent bipole fault on the CUDC line. Both Coal Creek units tripped at 0.30 sec.  |
| 3          | mqs      | 1          | 1          | 1          | Single line to ground fault with breaker fail at Sherco with 8N28 stuck. Trip Sherco generator 3.  |
| 4          | mss      | 1          | 1          | 1          | Single line to ground fault with breaker fail at Sherco with 8N32. Trip Sherco to Coon Creek 345 kV line.  |
| 5          | mts      | 1          | 1          | 1          | Single line to ground fault with breaker fail at Monticello with 8N6 stuck. Trip Monticello to Elm Creek 345 kV.   |
| 6          | nbz      | 1          | 1          | 1          | Three-phase fault at Chisago on Chisago County-Forbes 500 kV line.   |
| 7          | mad      | 1          | 1          | 1          | 4 cycle 3 phase fault at Dorsey 500 kV. Clear the Dorsey - Forbes 500 kV line.   |
| 8          | nad      | 1          | 1          | 1          | 4 cycle 3 phase fault at Forbes 500 kV. Clear the Forbes - Dorsey 500 kV line.   |
| 9          | mat      | 1          | 1          | 1          | Dorsey - Forbes line trip without a fault.   |
| 10         | oas      | 1          | 1          | 1          | single line to ground fault with breaker fail at Dorsey with 602L stuck. Trip D602F.   |
| 11         | pcs      | 1          | 1          | 1          | Single line to ground fault with breaker fail at King with 8P6 stuck. Trip King - Eau Claire - Arpin 345 kV line and King to Chisago County 345 kV line. |
| 12         | pct      | 1          | 1          | 1          | Trip King - Eau Claire - Arpin 345 kV line and King to Chisago County 345 kV line without fault  |
| 13         | pyt      | 1          | 1          | 1          | Trip of Prairie Island – Byron 345 kV without a fault  |
| 14         | pys      | 1          | 1          | 1          | 14 cycle SLG fault at Prairie Island 345 kV, trip Prairie Island-Byron 345 kV line.  |
| 15         | nbs      | 1          | 1          | 1          | SLGBF fault at Big Stone with 2665 stuck; Trip Big Stone - Ortonville 230 kV Line in 17 cycles   |
| 16         | nsc      | 1          | 1          | 1          | SLGBF fault at Big Stone with 2665 stuck; Trip Big Stone - Ortonville 230 kV Line in 14 cycles   |
| 17         | nmz      | 0          | 0          | 0          | 4 CYCLE, 3 PHASE FAULT AT CHISAGO TRIP F601C, XTRIP D602F; USE NEW 100% REDUCTION INIT FROM CHISAGO, LEAVE SVS ON MP SYS                                 |
| 18         | lb3      |            | 1          |            | 4 cycle 3 phase fault at Brookings County 345 kV. Clear the Brookings County-Lyon County 345 kV line.  |
| 19         | lf3      |            | 1          |            | 4 cycle 3-phase fault at Lyon County 345 kV. Clear the Lyon County-Franklin 345 kV line.   |
| 20         | fh3      |            | 1          |            | 4 cycle 3-phase fault at Helena 345 kV. Clear the Franklin-Helena 345 kV line.   |
| 21         | lh3      |            | 1          |            | 4 cycle 3-phase fault at Lake Marion. Clear the Helena-Lake Marion 345 kV line.  |
| 22         |          |            | 1          |            | 4 cycle 3-phase fault on Hazel 345 kV. Clear the 345/230 transformer.  |

|  |         |             |         |
|--|---------|-------------|---------|
| <b>disturbances specified to be run by above columns</b> | ag1 ei2 | ag1 ei2     | ag1 ei2 |
|  | mqs mss | mqs mss     | mqs mss |
|  | mts nbz | mts nbz     | mts nbz |
|  | mad nad | mad nad     | mad nad |
|  | mat oas | mat oas     | mat oas |
|  | pcs pct | pcs pct     | pcs pct |
|  | pyt pys | pyt pys     | pyt pys |
|  | nbs nsc | nbs nsc     | nbs nsc |
|  |         | lb3 lf3 fh3 |         |
|  |         | lh3         |         |