Standard Disturbance Cases

WECC staff simulates a group of standard disturbances on each base case before distribution to ensure that the power flow and stability data are compatible. The standard disturbances supply a dynamic and power flow data check to verify that the data responds well to several disturbances and, if there are any potential data discrepancies, they are noted for further investigation. The tables below show any issues staff saw during the simulations. Such issues should be further investigated by the appropriate data submitter.

24LSP2Sa

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	24LSP2Sa	ST-0	18			Dynamic	Extremely large qg movement at 181006	Model
2	24LSP2Sa	ST-0	20			Dynamic	Large pg movement 20188 20190	Model
3	24LSP2Sa	PDCI	21			Dynamic	Large efd instability 21666	Model
4	24LSP2Sa	Gila	21			Dynamic	Efd oscillations at 21651	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
5	24LSP2Sa	ST-0	30			Dynamic	Nuisance pickup at t=0 for locti 34738	Model
6	24LSP2Sa	ST-0	30			Dynamic	svsmo 31080 causing large efd spreads in area 30	Model
7	24LSP2Sa	ST-0	30			Dynamic	Efd oscillations at 365540	Model
8	24LSP2Sa	ST-0	30			Dynamic	Growing qg oscillations at 39554 39549	Model
9	24LSP2Sa	ST-0	40			Dynamic	Large efd spread 46732	Model
10	24LSP2Sa	ST-0	40			Dynamic	Spd oscillating above threshold at 48189	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
11	24LSP2Sa	ST-NWC-1	40			Dynamic	Growing pg oscillations 48061 48063	Model
12	24LSP2Sa	ST-0	50			Dynamic	Large efd movement 51216 51145	Model
13	24LSP2Sa	ST-0	50			Dynamic	Large qg spread at 80543 80544	Model
14	24LSP2Sa	ST-0	50			Dynamic	svsmo 51027 switching at t=30 causing large spreads	Model
15	24LSP2Sa	ST-0	54			Dynamic	Pg moving largely at 557120	Model
16	24LSP2Sa	ST-0	54			Dynamic	Pg instability 554986	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
17	24LSP2Sa	ST-0	54			Dynamic	Large qg spread at 59746 59757	Model
18	24LSP2Sa	ST-0	54			Dynamic	Spd above allowable threshold at 59011	Model
19	24LSP2Sa	ST-0	60			Dynamic	Pg moving largely at 610681	Model
20	24LSP2Sa	ST-0	65			Dynamic	Undamped efd oscillations 65542 65543 65544	Model
21	24LSP2Sa	ST-0	65			Dynamic	Large qg movement 69748	Model
22	24LSP2Sa	PDCI	65			Dynamic	Growing pg oscillations 69773 69723	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
23	24LSP2Sa	PDCI	65			Dynamic	Undamped efd decrease 65021	Model
24	24LSP2Sa	ST-0	70			Dynamic	Massive instability 70069 70070	Model
25	24LSP2Sa	ST-NWC-1	70			Dynamic	Massive pg instability 71013	Model
26	24LSP2Sa	ST-0	73			Dynamic	Pg oscillations 74042 74043	Model

24HW3a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	24HW3a	ST-DSW-1, ST-CAL-N	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault. This appears to be a modeling error	Model
2	24HW3a	ST-CAL-N	24			Dynamics	OEL1 limit exceeded for generator 5 at bus 29904 and for generator 7 at bus 29902	Performance
3	24HW3a	ST-CAL-N	30			Dynamics	OEL1 limit exceeded for generator 1 at bus 35078	Performance
4	24HW3a	ST-CAL-N	30			Dynamics	Generator at bus 365157 trips on voltage 1.5 seconds after fault	Performance
5	24HW3a	ST-CAL-S	30			Dynamics	At time 5.1500 unit tripped due to voltage violation of dV = 0.1000. Unit 1 at bus 365157 [Q1143BESS] 0.48	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
6	24HW3a	ST-IMW-1	60			Dynamics	OEL1 limit exceeded for generators at buses 60151 and 60152 during the fault	Performance
7	24HW3a	ST-DSW-1	19			Dynamics	Generator at bus 19981 and Generator at bus 19985 show a drop in Pg approximately 15 seconds post fault	Model
8	24HW3a	ST-CAL-S, ST-DSW-1, ST-CAL-S2	21			Dynamic	Exciters for generators at the following buses exhibit slow undamped oscillations post fault: bus 21655, 21658, 21659, and 21876. The effect was most pronounced in Power World, but is still present in PSLF	Model
9	24HW3a	ST-CAL-S2	21			Dynamic	Exciters for generators at bus 21651 exhibit small, fast oscillations in EFD post fault	Model
10	24HW3a	ST-CAL-S	70			Dynamic	QG of generator at bus 70721 continuously decreases post fault	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
11	24HW3a	ST-CAL-S2	22			Dynamics	Generators at buses 22942, 22945 and 22940 tripped on high voltage post fault in PowerWorld	Performance
12	24HW3a	ST-CAL-N, ST-DSW-1, ST-IMW-1	30			Dynamics	Generator at bus 31780 exhibited poorly damped oscillations post fault in Power World. Unit was netted in Power World	Model

24LW1a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	24LW1a	ST-DSW-1, ST-CAL-N	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault. This appears to be a modeling error	Model
2	24LW1a	ST-CAL-N	30			Dynamics	OEL1 limit exceeded for generator 1 at bus 35076 and generator 1 at bus 35077	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
3	24LW1a	ST-IMW-1 ST-UCN-1	30			Dynamics	Exciter for generator at bus 34640 exhibits oscillations post fault	Model
4	24LW1a	ST-CAL-S	21			Dynamics	Exciters of generators at bus 21651 show a fast oscillation post fault	Model
5	24LW1a	ST-CAL-S, ST-DSW-1, ST-CAL-S2	21			Dynamic	Exciters for generators at the following buses exhibit slow undamped oscillations post fault: bus 21655, 21658, 21659, and 21876. The effect was most pronounced in Power World, but is still present in PSLF	Model
6	24LW1a	ST-DSW-1	50			Dynamic	Exciter for generator at bus 80604 continuously increases starting at 28 seconds - required netting in PW	Model
7	24LW1a	ST-DSW-1	50			Dynamic	Exciter for generator at bus 50445 continuously increases starting at 28 seconds - required netting in PW	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
8	24LW1a	ST-CAL-N, ST-DSW-1, ST-IMW-1, ST-CAL-S2	30			Dynamics	Generator at bus 31780 exhibited poorly damped oscillations post fault in Power World. Unit was netted in Power World	Model
9	24LW1a	ST-CAL-S2	22			Dynamics	Generator at bus 22942 trips on voltage after fault clears in PW	Performance
10	24LW1a	ST-DSW-1	40			Dynamics	Generators at buses 47872 and 47873 trip approximately 1 second post fault due to low voltages in Power World. This may be due to low terminal voltage in the base case	Performance
11	24LW1a	ST-DSW-1	40			Dynamics	Generators at buses 627511, 627512, 627513 (Holter) netted out due to oscillations post fault in Power World	Model
12	24LW1a	ST-IMW-1	50			Dynamics	Exciter for generator at bus 51137 exhibits large slow oscillation post fault. Netted generator in PowerWorld	Model

24HSP1a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	24HSP1a	ST-DSW-1	40			Steady State	N-0, initial conditions for the load pocket near bus 40237 CHRSTMAS_VAL 115 are too low for the disturbance to solve. Bus voltage is 0.75 PU	Model
2	24HSP1a	ST-DSW-1, ST-CAL-N, ST-CAL-S	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault. This appears to be a modeling error	Model
3	24HSP1a	ST-NWC-1	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault in PowerWorld. This appears to be a modeling error	Model
4	24HSP1a	ST-DSW-1	18			Dynamics	Generator at bus 185804 trips on voltage 5 seconds after fault	Performance
5	24HSP1a	ST-DSW-1, ST-CAL-N	40			Dynamics	Generator at bus 47799 trips on voltage 8 seconds after fault	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
6	24HSP1a	ST-NWC-1, ST-IMW-1	40			Dynamics	Generator at bus 47799 trips on after fault in PowerWorld	Performance
7	24HSP1a	ST-CAL-N	30			Dynamics	OEL1 limits exceeded for generator 1 at bus 35078, generator 1 at bus 35076, generator 2 at bus 31406	Performance
8	24HSP1a	ST-CAL-N	30			Dynamics	LHVRT violation post fault for generator at bus 365659	Performance
9	24HSP1a	ST-CAL-S2	22			Dynamics	OEL1 limit for generator at bus 22997 exceeded during fault	Performance
10	24HSP1a	ST-DSW-1	19			Dynamics	Generator at bus 19981 and Generator at bus 19985 show a drop in Pg approximately 15 seconds post fault	Model
11	24HSP1a	ST-NWC-1	19			Dynamics	Generator at bus 19981 and Generator at bus 19985 show a drop in Pg approximately	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
							15 seconds post fault in PowerWorld	
12	24HSP1a	ST-UCN-1	70			Dynamics	OEL1 limit exceeded for unit C3 at bus 70777	Performance
13	24HSP1a	ST-UCN-1	70			Dynamics	Generator at bus 71013 trips due to voltage 31 seconds post fault	Performance
14	24HSP1a	ST-UCN-1	70			Dynamics	Qg of generator at bus 70721 continuously increases post fault	Model
15	24HSP1a	ST-CAL-S, ST-DSW-1, ST-CAL-S2	21			Dynamic	Exciters for generators at the following buses exhibit slow undamped oscillations post fault: bus 21655, 21658, 21659, and 21876. The effect was most pronounced in Power World, but is still present in PSLF	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
16	24HSP1a	ST-DSW-1, ST-CAL-S2	22			Dynamic	Qg output of generator 1 and 2 at buses 23298 and 23299 continuously increases post fault	Model
17	24HSP1a	ST-CAL-N, ST-DSW-1, ST-IMW-1	30			Dynamics	Generator at bus 31780 exhibited poorly damped oscillations post fault in Power World. Unit was netted in Power World.	Model
18	24HSP1a	ST-CAL-S2	22			Dynamic	Generators at buses 22942, 22945 and 22940 tripped on high voltage post fault in PowerWorld	Performance
19	24HSP1a	ST-CAL-S	21			Dynamic	Exciter of generator at bus 21876 oscillates then continuously increases post fault in PowerWorld	Model

29HW2a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	29HW2	ST-NWC-1	40			Steady State	Post transient voltages are below monitored levels	Model
2	29HW2	ST-DSW-1, ST-CAL-N, ST-CAL-S, ST-CAL-S2	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault. This appears to be a modeling error	Model
3	29HW2	ST-DSW-1	50			Dynamics	At time 12.2582 unit tripped due to voltage violation of dV = 0.1500. Unit 4 at bus 80544 [CSS .6W4] 0.69	Model
4	29HW2	ST-CAL-S, ST-DSW-1, ST-CAL-S2	21			Dynamics	Exciters for generators at the following buses exhibit slow undamped oscillations post fault: bus 21655, 21658, 21659, and 21876. The effect was most pronounced in Power World, but is still present in PSLF	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
5	29HW2	ST-CAL-N	21			Dynamics	At time 1.0375 OEL1 limit exceeded for unit 7 at bus 29902 [ELSEG7GT] 16.50	Model
6	29HW2	ST-CAL-N	21			Dynamics	At time 1.0375 OEL1 limit exceeded for unit 5 at bus 29904 [ELSEG5GT] 16.50	Model
7	29HW2	ST-CAL-N	21			Dynamics	At time 1.0375 OEL1 limit exceeded for unit 5 at bus 29904 [ELSEG5GT] 16.50	Model
8	29HW2	ST-CAL-N	30			Dynamics	At time 1.0375 OEL1 limit exceeded for unit 1 at bus 35078 [ELKHIL3G] 18.00	Model
9	29HW2	ST-CAL-S	30			Dynamics	At time 5.2375 unit tripped due to voltage violation of dV = 0.1000. Unit 1 at bus 365157 [Q1143BESS] 0.4	Model
10	29HW2	ST-CAL-S2, ST-IMW-1, ST-CAL-S,	21			Dynamics	Exciter for generator at bus 21012 exhibited oscillation post fault	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
		ST-UCN-1, ST-CAL-N						
11	29HW2	ST-CAL-S2-ST-IMW-1, ST-CAL-S, ST-UCN-1, ST-CAL-N	21			Dynamics	Exciter for generator at bus 21666 exhibited oscillation post fault	Model
12	29HW2	ST-CAL-S, ST-UCN-1, ST-CAL-N	60			Dynamics	Exciter for generator at bus 65021 exhibited oscillation post fault	Model
13	29HW2	ST-CAL-N	60			Dynamics	Qg continuously decreases post fault at bus 65021	Model
14	29HW2	ST-DSW-1	70			Dynamics	Qg continuously decreases post fault at bus 70070	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
15	29HW2	ST-DSW-1	40			Dynamics	Qg continuously decreases post fault at bus 40063	Performance
16	29HW2	ST-DSW-1	70			Dynamics	Qg continuously decreases post fault at bus 70069	Performance
17	29HW2	ST-DSW-1	50			Dynamics	Qg continuously decreases post fault at bus 50638	Performance
18	29HW2	ST-DSW-1	60			Dynamics	Qg continuously decreases post fault at bus 67908	Performance
19	29HW2	ST-DSW-1	21			Dynamics	Qg continuously decreases post fault at bus, 21666	Performance
20	29HW2	ST-CAL-S2	21			Dynamics	Unit tripped due to voltage violation of dV = 0.2000. Unit 1 at bus 22945 BUE GEN 1_G2 0.69 pgen = 26.27	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
							qgen = 19.09 mva = 48.56 pgen_ini = 26.00, 22945	
21	29HW2	ST-CAL-N	30			Dynamics	Unit tripped due to voltage violation of dV = 0.1000. Unit 1 at bus 365157 Q1143BESS 0.48 pgen = 8.00 qgen = 4.88 mva = 12.50 pgen_ini = 8.00, 365157	Performance
22	29HW2	ST-DSW-1	40			Dynamics	Unit tripped due to frequency violation of df = -0.0600. Unit Z1 at bus 47995 HORNB W1 0.58 pgen = 71.98 qgen = 14.99 mva = 82.10 pgen_ini = 72.00, 47995	Performance
23	29HW2	ST-CAL_N	24			Dynamics	Generator at bus 24268 trips 5 seconds post fault on voltage	Performance
24	29HW2	ST-CAL_N	24			Dynamics	Generator at bus 24263 trips 5 seconds post fault on voltage	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
25	29HW2	ST-CAL-S2	20			Dynamics	The generator relays at buses 22942, 22949, and 22945 tripped during the North Gila run	Performance

29HS2a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	29HS2a	ST-0	18		18	Dynamic	Large qg movement during no disturbance at 181006	Model
2	29HS2a	ST-CAL-S2	21		211	Dynamic	Growing efd oscillations at 21666	Model
3	29HS2a	ST-0	24		740	Dynamic	Large spd spreads at 24276	Model
4	29HS2a	ST-0	30		390	Dynamic	locti at 34738 34370 have nuisance pickup at t=0	Model

5	29HS2a	ST-NWC-1	30		390	Dynamic	Growing pg instability at 37307	Model
6	29HS2a	ST-CAL-N	30		390	Dynamic	Massive efd oscillations at 32700	Model
7	29HS2a	ST-0	40		937	Dynamic	Unit at 47873 tripping on voltage during no disturbance	Model
8	29HS2a	ST-0	40		29	Dynamic	Spd spread at 48189 above allowable threshold	Model
9	29HS2a	ST-0	40		987	Dynamic	Efd instability at 44006 44007 44008 44009	Model
10	29HS2a	ST-0	40		38	Dynamic	Large efd spread at 46732	Model

11	29HS2a	ST-0	52		75	Dynamic	Large pg movement at 52154	Model
12	29HS2a	ST-0	52		75	Dynamic	Large efd movement and pg oscillations at 52123	Model
13	29HS2a	ST-0	50		10	Dynamic	Growing pg oscillations at 50177	Model
14	29HS2a	ST-0	50		202	Dynamic	Large qg spreads at 80543 80544 causing efd issues	Model
15	29HS2a	ST-NWC-1	50		202	Dynamic	Efd spread at 51240 above allowable threshold	Model
16	29HS2a	ST-0	54		76	Dynamic	svsmo models at 57737 578736 do not have enough parameters	Model

17	29HS2a	ST-0	54		76	Dynamic	Pg at 557120 moving too much for no disturbance	Model
18	29HS2a	ST-0	54		76	Dynamic	Extremely large qg spread at 59746 59757	Model
19	29HS2a	ST-0	54		76	Dynamic	Spd spread at 59011 above allowable threshold	Model
20	29HS2a	ST-NWC-1	54		76	Dynamic	Efd and pg oscillations at 58334	Model
21	29HS2a	ST-0	60		11	Dynamic	Pg at 610681 moving largely during no disturbance	Model
22	29HS2a	ST-0	65		7	Dynamic	Massive qg instability at 69017	Model

23	29HS2a	ST-0	65		7	Dynamic	Undamped efd oscillations at 65542 65543 65544	Model
24	29HS2a	ST-0	65		7	Dynamic	Pg at 69805 moving too much for no disturbance	Model
25	29HS2a	ST-0	65		7	Dynamic	Undamped efd decrease/increase at 65021	Model
26	29HS2a	ST-0	65		7	Dynamic	Qg instability and oscillations at 69773 65815 69816	Model
27	29HS2a	ST-0	65		7	Dynamic	Large qg movement at 69748 causing efd issues	Model
28	29HS2a	ST-DSW-1	70		66	Dynamic	Massive pg instability at 71013	Model

29	29HS2a	ST-0	73			60	Dynamic	Pg oscillations at 74042 74043	Model

24HS3b

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	24HS3a	ST-DSW-1	10			Steady State	Post transient voltages are above monitored levels at buses 10068, 10334, 10358, 12006, 12019, 12020, 12021, 12062, 12063, 12124, 12162, 12128. This is related to the tripping of the Rosebud motors that was required to solve the post-transient case. The SVDs are not unlocked for the solve - but if they are enabled the voltage deviation decreases significantly. This appears to be a load pocket that may need some additional voltage support for this outage if these motors trip	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
2	24HS3a	ST-DSW-1	19			Dynamics	Generator at bus 19981 and Generator at bus 19985 show a drop in Pg approximately 15 seconds post fault	Model
3	24HS3a	ST-DSW-1	50			Dynamics	EFD of generators at bus 50445 exhibits undamped oscillation and had to be netted	Model
4	24HS3a	ST-CAL-S, ST-DSW-1, ST-CAL-S2	21			Dynamic	Exciters for generators at the following buses exhibit slow undamped oscillations post fault: bus 21655, 21658, 21659, and 21876. The effect was most pronounced in Power World, but is still present in PSLF	Model
5	24HS3a	ST-DSW-1	15			Dynamics	QG of generator at bus 159013 continuously decreases post fault	Model
6	24HS3a	ST-DSW-1	50			Dynamic	Exciter for generator at bus 80604 oscillates and increases post fault	Model
7	24HS3a	ST-UCN-1	70			Dynamic	PG and Qg of generator at bus 71013 exhibited sudden sharp drops and	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
							returns during the disturbance. Generator was netted in the final case	
8	24HS3a	ST-CAL-S	30			Dynamics	Generator at bus 27359 "GRAYS_9 "13.80 netted due to spikes and oscillations in PG during the Diablo Midway outage	Performance
9	24HS3a	ST-DSW-1, ST-CAL-N	40			Dynamics	Generator at bus 47873 trips on voltage 1 second post fault	Performance
10	24HS3a	ST-CAL-N	40			Dynamics	Generator at bus 47872 trips on voltage 1 second post fault	Performance
11	24HS3a	ST-DSW-1, ST-CAL-N, ST-CAL-S	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault. This appears to be a modeling error	Model
12	24HS3a	ST-DSW-1, ST-CAL-N	18			Dynamics	Generator at bus 185804 trips on voltage post fault	Performance
13	24HS3a	ST-CAL-N	30			Dynamics	During the fault, OEL1 limit exceeded for unit 1 at bus 35078, unit 1 at bus 35076, and unit 1 at bus 35077	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
14	24HS3a	ST-CAL-N	24			Dynamics	During the fault, OEL1 limit exceeded for unit 7 at bus 29902, and unit 5 at bus 29904	Performance
15	24HS3a	ST-CAL-N	30			Dynamics	After the fault cleared, OEL1 limit exceeded for unit 1 at bus 31406, unit 1 at bus 35004, unit 2 at bus 35004, and unit 3 at bus 35004	Performance
16	24HS3a	ST-CAL-N	30			Dynamics	After the fault cleared, Unit 1 at bus 32181 tripped due to voltage violation of dV = -0.1020	Performance
17	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29049 trips on voltage post fault	Performance
18	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29066 trips on voltage post fault	Performance
19	24HS3a	ST-CAL-N	40			Dynamics	Generator at bus 47924 trips on voltage 2 seconds post fault	Performance
20	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29896 trips on voltage 2 seconds post fault	Performance
21	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 24011 trips on frequency 2 seconds post fault	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
22	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29884 trips 3 seconds post fault on voltage	Performance
23	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29730 trips 5 seconds post fault on voltage	Performance
24	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29296 trips 8 seconds post fault on voltage	Performance
25	24HS3a	ST-CAL-N	26			Dynamics	Generator at bus 27221 trips 8 seconds post fault on voltage	Performance
26	24HS3a	ST-CAL-N	26			Dynamics	Following generators trip on voltage approximately 10 - 20 seconds post fault: Unit 1 at bus 26868, Unit 2 at bus 26870, Unit 5 at bus 26876, Unit 6 at bus 26878, Unit B at bus 26901	Performance
27	24HS3a	ST-CAL-N	26			Dynamics	Following generators trip on voltage approximately 23 seconds post fault: Unit 1 at bus 26960	Performance
28	24HS3a	ST-CAL-N	24			Dynamics	Generator at bus 29724 trips 29 seconds post fault on voltage	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
29	24HS3a	ST-UCN-1	70			Dynamic	TLIN1 on branch FROM 70223 TO 70453 ID 1 tripped. This led to the load at 70404 tripping as well	Performance
30	24HS3a	ST-CAL-S	24			Dynamics	Generator at bus 29069 trips post fault on voltage	Performance
31	24HS3a	ST-CAL-S	26			Dynamics	Following generators trip on voltage approximately post fault: Unit 2 at bus 26870, Unit 5 at bus 26876, Unit 6 at bus 26878	Performance
32	24HS3a	ST-CAL-S	26			Dynamics	Following generator trips on voltage 2 seconds post fault: Unit 1 at bus 27226	Performance
33	24HS3a	ST-CAL-S	26			Dynamics	Following generator trips on voltage 17 seconds post fault: Unit 2 at bus 27230	Performance
34	24HS3a	ST-CAL-S2	22			Dynamic	Post fault, OEL1 limit exceeded for unit 7 at bus 29902, unit 5 at bus 29904, and Unit 6 at bus 29903	Performance
35	24HS3a	ST-DSW-1, ST-NWC-1	19			Dynamics	Generator at bus 19981 and Generator at bus 19985 show a drop in Pg approximately 15 seconds post fault. This occurs for	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
							the Double Palo in PSLF, but in PowerWorld it also occurs in the Chief Joe Brake disturbance	
36	24HS3a	ST-DSW-1	70			Dynamics	Generators at buses 70069 and 70070 trip 4.5 seconds post fault on frequency in Power World	Performance
37	24HS3a	ST-UCN-1	10			Dynamics	Generator models for motors at bus 12063 had to be tripped as part of the simulation in Power World. If they were not tripped, they oscillated quickly for the duration of the simulation	Performance
38	24HS3a	ST-CAL-S2	22			Dynamics	Post fault, generators at buses 23442, 22942, and 22945 all tripped on voltage	Performance
39	24HS3a	ST-UCN-1	70			Dynamics	Post fault, Qg of generator at bus 70721 continuously increases	Model

24LS1a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	24LS1a	ST-NWC-1	21		211	Dynamic	Growing efd oscillations at 21666	Model
2	24LS1a	ST-CAL-S2	21		211	Dynamic	High frequency efd oscillations at 21651	Model
3	24LS1a	ST-0	30		390	Dynamic	Nuisance pickup for locti 34738 at t=0	Model
4	24LS1a	ST-0	30		390	Dynamic	Svsmo models at 31080 33210 causing large efd spreads in area 30	Model
5	24LS1a	ST-NWC-1	30		363	Dynamic	Pg instability at 37307 causing simulations to abort	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
6	24LS1a	ST-DSW-1	30		360	Dynamic	Qg oscillations beginning around 30 seconds after adding composite load models at 33873	Model
7	24LS1a	ST-0	40		987	Dynamic	Large pg spread at 403442	Model
8	24LS1a	ST-0	40		14	Dynamic	Msc1 40692 switching during no disturbance	Model
9	24LS1a	ST-NWC-1	40		987	Dynamic	Persistent data issues 40346	Model
10	24LS1a	ST-0	52		75	Dynamic	Large pg and efd spreads at 52154	Model
11	24LS1a	ST-0	52		75	Dynamic	Efd and spd issues at 52123	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
12	24LS1a	ST-0	50		10	Dynamic	Growing pg oscillations at 50177	Model
13	24LS1a	ST-0	50		202	Dynamic	Large efd movement at 51216 and 51145	Model
14	24LS1a	ST-0	50		202	Dynamic	Growing efd oscillations at 51499	Model
15	24LS1a	ST-0	50		10	Dynamic	Unstable efd behavior at 50304 50305 80541 80542 80543 80544	Model
16	24LS1a	ST-0	50		10	Dynamic	Growing efd oscillations at 80434 80620	Model
17	24LS1a	ST-0	54		76	Dynamic	Extremely large qg spread at 59746 59757	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
18	24LS1a	ST-0	54		76	Dynamic	Spd spread over allowable threshold after adding composite load models at 59011	Model
19	24LS1a	ST-0	60		11	Dynamic	Pg moving largely at 60442	Model
20	24LS1a	ST-0	65		7	Dynamic	Units at 69013 69017 causing solution to diverge	Model
21	24LS1a	ST-0	65		7	Dynamic	Undamped efd oscillations at 65542 65543 65544	Model
22	24LS1a	ST-0	65		7	Dynamic	Large qg spread at 69748	Model
23	24LS1a	ST-NWC-1	65		7	Dynamic	Growing qg oscillations at 69723 69773	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
24	24LS1a	ST-DSW-1	65		7	Dynamic	Undamped efd increase at 65021	Model
25	24LS1a	ST-0	70		65	Dynamic	High frequency efd oscillations at 70314 70315	Model
26	24LS1a	ST-NWC-1	70		65	Dynamic	Extremely large spd spreads at gens controlled by repc 70739	Model
27	24LS1a	ST-DSW-1	70		66	Dynamic	Massive pg instability at 71013	Model

34HW1b

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	34HW1a	ST-0	15		80	Dynamic	Growing efd oscillations at 150227 150228	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
2	34HW1a	ST-NWC-1	21		211	Dynamic	Growing efd oscillations at 21666	Model
3	34HW1a	ST-0	24		740	Dynamic	Spd over allowable threshold at 24276	Model
4	34HW1a	ST-NWC-1	26		124	Dynamic	Spd over allowable threshold at 27117	Model
5	34HW1a	ST-0	30		390	Dynamic	Nuisance pickup for locti 34738	Model
6	34HW1a	ST-0	40		38	Dynamic	Large efd spread at 46732	Model
7	34HW1a	ST-0	40		987	Dynamic	Efd instability at 44006 44007 44008 44009	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
8	34HW1a	ST-CAL-N	40		987	Dynamic	Persistent data issues 40346	Model
9	34HW1a	ST-0	50		10	Dynamic	Growing pg oscillations at 50177	Model
10	34HW1a	ST-0	50		202	Dynamic	Large efd spread at 51216	Model
11	34HW1a	ST-0	50		202	Dynamic	Large qg spreads at 80543 80544	Model
12	34HW1a	ST-0	54		76	Dynamic	Large qg spreads at 59746 59757	Model
13	34HW1a	ST-DSW-1	62		622	Dynamic	Unit at 621521 causing solution to diverge	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
14	34HW1a	ST-0	65		7	Dynamic	Undamped efd oscillations at 65542 65543 65544	Model
15	34HW1a	ST-DSW-1	65		7	Dynamic	Undamped efd increase/decrease at 65021	Model
16	34HW1a	ST-NWC-1	70		66	Dynamic	Massive pg instability at 71013	Model
17	34HW1a	ST-NWC-1	70		65	Dynamic	Spd spread over allowable threshold at 70739 70736 70775 70742 70733	Model
18	34HW1a	ST-NWC-1	70		65	Dynamic	High frequency efd oscillations at 70314 70315	Model
19	34HW1a	ST-0	73		60	Dynamic	Pg oscillations at 74042 74043	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
20	34HW1a	ST-0	73		95	Dynamic	Pg oscillations at 73720	Model

34HS1a

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
1	34HS1a	ST-DSW-1, ST-CAL-N, ST-CAL-S, ST-CAL-S2	40			Dynamics	Generator at bus 47995 trips on frequency 1 second after fault. This appears to be a modeling error	Model
2	34HS1a	ST-DSW-1, ST-CAL-N, ST-CAL-S, ST-CAL-S2	18			Dynamics	Post fault, Unit 1 at bus 185804 tripped due to voltage violation of dV = 0.1000	Performance
3	34HS1a	ST-CAL-N	24			Dynamics	During fault, OEL1 limit exceeded for unit 7 at bus 29902, unit 6 at bus 29903, and unit 5 at bus 29904	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
4	34HS1a	ST-CAL-N	30			Dynamics	During fault, OEL1 limit exceeded for unit 1 at bus 35076, unit 1 at bus 35077, and unit 1 at bus 35078	Performance
5	34HS1a	ST-CAL-N	30			Dynamics	Post fault, OEL1 limit exceeded for unit 1 and unit 2 at bus 31406	Performance
6	34HS1a	ST-CAL-N	24			Dynamics	Post fault, OOSLEN timed out for branch FROM24015 [ARCO SC] 230.00 TO 24011 [ARCO 1G] 13.80 ckt [1] opens branch. This leads to generator 1 at bus 24011 tripping as well	performance
7	34HS1a	ST-CAL-N	30			Dynamics	Post fault, Unit 1 at bus 32181 tripped due to voltage violation of dV = -0.1020.	Performance
8	34HS1a	ST-CAL-N	24			Dynamics	Post fault, Unit EQ at bus 29896 tripped due to voltage violation of dV = -0.1200.	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
9	34HS1a	ST-CAL-N	24			Dynamics	Post fault, Unit EQ at bus 29884 tripped due to voltage violation of dV = -0.1500	Performance
10	34HS1a	ST-CAL-N, ST-CAL-S	40			Dynamics	Post fault, Unit Z1 at bus 47866 tripped due to voltage violation of dV = 0.1000 32 seconds post fault	Performance
11	34HS1a	ST-CAL-S	24			Dynamics	Post fault, OEL1 limit exceeded for unit 7 at bus 29902, unit 6 at bus 29903, and for unit 5 at bus 29904	Performance
12	34HS1a	ST-CAL-S	24			Dynamics	Post fault, Unit 1 at bus 29069 tripped due to voltage violation of dV = -0.2500	Performance
13	34HS1a	ST-CAL-S, ST-CAL-S2	30			Dynamics	Post fault, Unit 1 at bus 34683 tripped due to voltage violation of dV = 0.2000	Performance

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
14	34HS1a	ST-CAL-S, ST-CAL-S2	24			Dynamics	Post fault, Unit 1 at bus 24340 tripped due to voltage violation	Performance
15	34HS1a	ST-CAL-S2	24			Dynamics	Post fault, OEL1 limit exceeded for unit 3 at bus 29903	Performance
16	34HS1a	ST-UCN-1	10			Dynamics	Post fault, OOSLEN timed out for branch 12020 [CLAPHAM] 115.00 12062 [ROSEBUD] 115.00 ckt [1] and opened the branch. This also leads to the loss of the motors at bus 12063 as well	Performance
17	34HS1a	ST-NWC-1, ST-CAL-S	50			Dynamics	Exciters of generators at bus 51240 exhibited poorly damped oscillations post fault. Netted	Model
18	34HS1a	ST-DSW-1	19			Dynamics	Pg of generators at buses 19981 and 19985 decreases approximately 14 seconds post fault	Model

Item #	Base Case	Standard Disturbance	Base Case Area	Owner of Disturbance	Owner of System Deficiency	Steady State or Dynamic	Issue Description	Model or Performance
19	34HS1a	ST-DSW-1	50			Dynamics	Exciters of units at bus 50445 exhibited slow undamped oscillations post fault	Model
20	34HS1a	ST-DSW-1	50			Dynamics	Exciter of unit at bus 80604 exhibited non-linear behavior 30 seconds post fault	Model
21	34HS1a	ST-DSW-1	15			Dynamics	Qg of generator bus 159049 continuously increases post fault	Model
22	34HS1a	ST-CAL-S, ST-CAL-S2	62			Dynamics	PG of generators at buses 623522 and 623542 starts decreasing post fault and eventually reaches 0 MW approximately 14 seconds post fault	Model
23	34HS1a	ST-CAL-N	54			Dynamics	Exciter of generator at bus 55146 exhibited slow, poorly damped oscillations post fault	Model