Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-1	Biola-Glass-Madera 70kV (Trigo Jct-El Peco Tap Section)	Base Case	A	N-0	<90%	<90%	108.2%	Reconductor line
FR-SP-T-2	Kearney-Caruthers 70kV	Base Case	A	N-0	114.0%	<90%	<90%	Accelerate approved project
FR-SP-T-3	Borden #1 230/70kV	Borden #2 230/70kV	B	T-1	96.0%	97.0%	108.9%	Upgrade Borden #1 230/70kV to at least 200/220 MVA
FR-SP-T-4	Oro Loma #2 115/70kV	Los Banos-Livingston Jct-Canal 70kV	B	T-1	118.7%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-5	Los Banos-Livingston Jct-Canal 70kV (Los Banos-Chevron Pipeline Section)	Oro Loma #2 115/70kV	B	T-1	122.0%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-6	Los Banos-Livingston Jct-Canal 70kV (Santa Nella-Livingston Jct Section)	Oro Loma #2 115/70kV	B	T-1	104.0%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-7	Coalinga 1-Coalinga 2 70kV (Coalinga 1-Tornado Tap Section)	Gates-Coalinga 1 70kV	B	L-1	101.9%	<90%	<90%	Action Plan. Open Coalinga-San Miguel 70kV (Summer Setup).
FR-SP-T-8	Panoche-Oro Loma 115kV (Panoche-Hammonds Section)	Panoche-Mendota 115kV	B	L-1	94.1%	104.4%	113.2%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-9	Reedley-Orosi 70kV (Orosi Jct-Orosi Section)	Reedley-Dinuba 70kV	B	L-1	104.7%	<90%	<90%	Action Plan. Reedley-Orosi 70kV reconductor mitigates later years
FR-SP-T-10	Reedley-Orosi 70kV (Reedley-Orosi Jct Section)	Reedley-Dinuba 70kV	B	L-1	100.7%	<90%	<90%	Action Plan. Reedley-Orosi 70kV reconductor mitigates later years
FR-SP-T-11	Reedley-Dinuba 70kV (Dinuba Jct-Dinuba Section)	Reedley-Orosi 70kV	B	L-1	102.1%	<90%	<90%	Action Plan. Reedley-Dinuba 70kV reconductor mitigates later years

Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-12	Reedley-Dinuba 70kV (Reedley-Dinuba Jct Section)	Reedley-Orosi 70kV & Dinuba Energy Unit 1	B	G-1/L-1	104.1%	<90%	<90%	Action Plan. Reedley-Dinuba 70kV reconductor mitigates later years
FR-SP-T-13	Borden #1 230/70kV	Borden E 70kV Bus	C1	Bus	90.7%	97.6%	110.6%	Upgrade Borden #1 230/70kV to at least 200/220 MVA
FR-SP-T-14	Borden-Madera #2 70kV	Borden D 70kV Bus	C1	Bus	126.3%	133.8%	147.6%	Reconductor Borden-Madera #1 & #2 70kV
FR-SP-T-15	Coalinga 1-Coalinga 2 70kV (Coalinga 1-Tornado Tap Section)	Gates 70kV Bus	C1	Bus	<90%	102.4%	98.9%	Reconductor Coalinga 1-Coalinga 2 70kV line
FR-SP-T-16	Panoche-Oro Loma 115kV (Panoche-Hammonds Section)	Panoche #1 115kV Bus	C1	Bus	<90%	100.0%	107.4%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-17	Herndon-Bullard #1 115kV (Pinedale Jct-Bullard Section)	Herndon #1 115kV Bus	C1	Bus	99.8%	99.2%	100.3%	Radial line from Herndon 115kV. Consider SPS.
FR-SP-T-18	Los Banos-Livingston Jct-Canal 70kV (Los Banos-Chevron Pipeline Section)	Panoche #2 115kV Bus	C1	Bus	118.5%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-19	Oro Loma #2 115/70kV	Los Banos 70kV Bus	C1	Bus	522.0%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-20	Los Banos-Canal-Oro Loma #1 70kV (Oro Loma-Mercy Springs Section)	Los Banos 70kV Bus	C1	Bus	231.0%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-21	Los Banos-Canal-Oro Loma #1 70kV (Ortiga-Mercy Springs Section)	Los Banos 70kV Bus	C1	Bus	213.0%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.

Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-22	Los Banos-Canal-Oro Loma 70kV (Canal-Ortiga Section) (2016 Case) Mercy Springs-Canal 70kV (Canal-Ortiga Section) (2019 & Later)	Los Banos 70kV Bus	C1	Bus	151.3%	<90%	<90%	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-23	Los Banos-Livingston Jct-Canal 70kV (Santa Nella-Livingston Jct Section)	Panoche #2 115kV Bus	C1	Bus	100.4%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-24	Oro Loma-Canal #1 70kV (Dos Palos-Santa Rita Section)	Los Banos 70kV Bus	C1	Bus	215.3%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-25	Oro Loma-Canal #1 70kV (Oro Loma-Dos Palos Section)	Los Banos 70kV Bus	C1	Bus	285.6%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-26	Oro Loma-Canal #1 70kV (Santa Rita-Canal Section)	Los Banos 70kV Bus	C1	Bus	160.6%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-27	Oro Loma-Mendota 70kV (Oro Loma-Poso Jct Section)	Los Banos 70kV Bus	C1	Bus	103.8%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-28	Panoche-Oro Loma 115kV (DFS Tap-Oro Loma Section)	Los Banos 70kV Bus	C1	Bus	227.6%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-29	Panoche-Oro Loma 115kV (Hammonds-DFS Tap Section)	Los Banos 70kV Bus	C1	Bus	231.7%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.

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Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-30	Panoche-Oro Loma 115kV (Panoche-Panoche Jct Section)	Los Banos 70kV Bus	C1	Bus	113.2%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-31	Wilson-Merced #1 115kV	Wilson B 115kV Bus	C1	Bus	118.6%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-32	Wilson-Merced #2 115kV	Wilson A 115kV Bus	C1	Bus	115.7%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-33	Not Solved	Herndon #2 115kV Bus	C1	Bus	Not Solved	Not Solved	Not Solved	Mitigation alternatives under review
FR-SP-T-34	Barton-Airways-Sanger 115kV (Airways-Sanger Section)	Herndon CB202 230kV Failure	C2	Breaker	102.7%	<90%	<90%	Action Plan. New Northern Fresno 115kV Reinforcement Project mitigates later years.
FR-SP-T-35	GWF-Kingsburg 115kV (Contadina-Kingsburg Section)	McCall CB202 230kV Failure	C2	Breaker	110.5%	94.3%	98.0%	Consider SPS.
FR-SP-T-36	GWF-Kingsburg 115kV (GWF-Contadina Section)	McCall CB202 230kV Failure	C2	Breaker	114.9%	98.5%	102.3%	Consider SPS.
FR-SP-T-37	Herndon-Barton 115kV	McCall CB202 230kV Failure	C2	Breaker	118.5%	<90%	<90%	Action Plan. New Northern Fresno 115kV Reinforcement Project mitigates later years.
FR-SP-T-38	Oro Loma-Mercy Springs 70kV	Panoche CB102 115kV Failure	C2	Breaker	N/A	111.1%	122.7%	Add second Oro Loma-Mercy Springs 70kV line or consider SPS.
FR-SP-T-39	Los Banos-Livingston Jct-Canal 70kV (Los Banos-Chevron Pipeline Section)	Panoche CB202 230kV Failure	C2	Breaker	104.1%	<90%	<90%	Not Solved. Oro Loma 70 kV Area Reinforcement mitigates later years.

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Thermal Overloads

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					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-40	Los Banos-Livingston Jct-Canal 70kV (Santa Nella-Livingston Jct Section)	Panoche CB102 115kV Failure	C2	Breaker	105.5%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-41	Oro Loma #2 115/70kV	Panoche CB102 115kV Failure	C2	Breaker	<90%	100.9%	104.6%	Upgrade Oro Loma #2 115/70kV transformer
FR-SP-T-42	Manchester-Herndon 115kV	McCall CB202 230kV Failure	C2	Breaker	120.2%	<90%	<90%	Action Plan. New Northern Fresno 115kV Reinforcement Project mitigates later years.
FR-SP-T-43	McCall-Sanger #3 115kV	Herndon CB202 230kV Failure	C2	Breaker	100.8%	<90%	<90%	Action Plan. New Northern Fresno 115kV Reinforcement Project mitigates later years.
FR-SP-T-44	Schindler-Huron-Gates 70kV (Huron Jct-Calflax Section)	Panoche CB102 115kV Failure	C2	Breaker	108.2%	108.5%	117.4%	Reconductor limiting section.
FR-SP-T-45	Biola-Glass-Madera 70kV (Canandaigua-Glass Section)	Borden-Madera #1 & #2 70kV	C3	L-1-1	111.9%	120.3%	134.1%	Reconductor Borden-Madera #1 & #2 70kV or consider SPS to drop load
FR-SP-T-46	Biola-Glass-Madera 70kV (Trigo Jct-Canandaigua)	Borden-Madera #1 & #2 70kV	C3	L-1-1	101.7%	110.0%	123.7%	Reconductor Borden-Madera #1 & #2 70kV or consider SPS to drop load
FR-SP-T-47	Biola-Glass-Madera 70kV (Trigo Jct-Trigo Section)	Borden-Madera #1 & #2 70kV	C3	L-1-1	<90%	91.8%	103.0%	Reconductor Borden-Madera #1 & #2 70kV or consider SPS to drop load
FR-SP-T-48	Borden-Glass 70kV	Borden-Madera #1 & #2 70kV	C3	L-1-1	127.9%	136.4%	150.2%	Reconductor Borden-Madera #1 & #2 70kV or consider SPS to drop load
FR-SP-T-49	Borden-Madera #1 70kV	Borden-Glass 70kV & Borden-Madera #2 70kV	C3	L-1-1	127.0%	135.4%	149.0%	Reconductor Borden-Madera #1 & #2 70kV or consider SPS to drop load

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Thermal Overloads

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					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-50	Borden-Madera #2 70kV	Borden-Glass 70kV & Borden-Madera #1 70kV	C3	L-1-1	125.5%	133.6%	146.8%	Reconductor Borden-Madera #1 & #2 70kV or consider SPS to drop load
FR-SP-T-51	Atwater-Livingston-Merced 115kV (Atwater Jct-Merced)	Atwater-El Capitan 115kV & Wilson-Atwater #2 115kV	C3	L-1-1	142.8%	<90%	<90%	Existing Atwater SPS mitigates
FR-SP-T-52	Atwater-Livingston-Merced 115kV (Atwater-Atwater Jct)	Atwater-El Capitan 115kV & Wilson-Atwater #2 115kV	C3	L-1-1	162.3%	<90%	<90%	Existing Atwater SPS mitigates
FR-SP-T-53	Chowchilla-Kerckhoff 2 115kV (Certainteed Jct-Sharon Tap Section)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	186.2%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-54	Chowchilla-Kerckhoff 2 115kV (Chowchilla-Certainteed Jct Section)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	187.2%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-55	Chowchilla-Kerckhoff 2 115kV (Kerckhoff 1 Jct-Kerckhoff 2 Section)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	154.8%	<90%	91.8%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-56	Chowchilla-Kerckhoff 2 115kV (Oakhurst Jct-Kerckhoff 1 Jct Section)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	155.1%	<90%	91.9%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-57	Chowchilla-Kerckhoff 2 115kV (Sharon Tap-Oakhurst Jct Section)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	209.1%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-58	Dairyland-Le Grand 115kV	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	146.7%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-59	Exchequer-Le Grand 115kV	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	175.3%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.

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Thermal Overloads

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FR-SP-T-60	Le Grand-Chowchilla 115kV (Certainteed Tap)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	141.4%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-61	Le Grand-Chowchilla 115kV (Chowchilla Tap)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	141.4%	<90%	<90%	Not Solved. Oro Loma-Mendota 115kV Conversion Project mitigates later years.
FR-SP-T-62	Coalinga #1-San Miguel 70kV	Gates #5 230/70kV & Schindler #1 115/70kV	C3	T-1-1	117.8%	<90%	<90%	Action Plan. Open Coalinga-San Miguel 70kV (Summer Setup).
FR-SP-T-63	Coalinga 1-Coalinga 2 70kV (Coalinga 1-Tornado Tap Section)	Templeton-Gates 230kV & Gates-Coalinga 1 70kV	C3	L-1-1	114.6%	<90%	<90%	Action Plan. Open Coalinga-San Miguel 70kV (Summer Setup).
FR-SP-T-64	Coalinga 1-Coalinga 2 70kV (Tornado Tap-Pennzier Tap Section)	Gates #5 230/70kV & Schindler #1 115/70kV	C3	T-1-1	101.8%	<90%	<90%	Action Plan. Open Coalinga-San Miguel 70kV (Summer Setup).
FR-SP-T-65	Gregg-Ashlan 230kV (Gregg-Figarden 2 Tap)	Gregg-Herndon #1 & #2 230kV	C3	L-1-1	121.2%	<90%	<90%	Action Plan. New Northern Fresno 115kV Reinforcement Project mitigates later years.
FR-SP-T-66	Kings River-Sanger-Reedley 115kV (Piedra 1 SW-Reedley Section)	Sanger-Reedley 115kV & McCall-Reedley (McCall-Wahtoke Section)	C3	L-1-1	149.4%	<90%	<90%	Action Plan. New McCall-Reedley #2 115kV line mitigates later years.
FR-SP-T-67	Kings River-Sanger-Reedley 115kV (Rainbow Tap-Piedra 1 SW Section)	Sanger-Reedley 115kV & McCall-Reedley (McCall-Wahtoke Section)	C3	L-1-1	149.4%	<90%	<90%	Action Plan. New McCall-Reedley #2 115kV line mitigates later years.
FR-SP-T-68	Kings River-Sanger-Reedley 115kV (Sanger-Rainbow Tap Section)	Sanger-Reedley 115kV & McCall-Reedley (McCall-Wahtoke Section)	C3	L-1-1	118.2%	<90%	<90%	Action Plan. New McCall-Reedley #2 115kV line mitigates later years.

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Thermal Overloads

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FR-SP-T-69	Los Banos 230/70kV #3	Los Banos #4 230/70kV & Oro Loma #2 115/70kV	C3	T-1-1	123.2%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-70	Los Banos-Canal-Oro Loma #1 70kV (Oro Loma-Mercy Springs Section) (2016 Case) Los Banos-Mercy Springs 70kV (2018 and later)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	136.1%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-71	Los Banos-Canal-Oro Loma #1 70kV (Oro Loma-Mercy Springs Section) (2016 Case) Oro Loma-Mercy Springs 70kV (2018 and later)	Panoche-Mendota 115kV & Panoche-Oro Loma 115kV	C3	L-1-1	<90%	<90%	106.1%	Add second Oro Loma-Mercy Springs 70kV line or consider SPS.
FR-SP-T-72	Los Banos-Canal-Oro Loma #1 70kV (Ortiga-Mercy Springs Section)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	159.2%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-73	Los Banos-Canal-Oro Loma 70kV (Mercy Springs-Q648 Section)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	205.1%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-74	Los Banos-Canal-Oro Loma 70kV (Q648-Arburua Section)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	193.9%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-75	Los Banos-Livingston Jct-Canal 70kV (Canal-Livingston Jct Section)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	171.0%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-76	Los Banos-Livingston Jct-Canal 70kV (Chevron Pipeline-Santa Nella Section)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	207.1%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate

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					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-77	Los Banos-Livingston Jct-Canal 70kV (Los Banos-Chevron Pipeline Section)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	257.8%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-78	Los Banos-Livingston Jct-Canal 70kV (Santa Nella-Livingston Jct Section)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	241.2%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-79	Los Banos-Canal-Oro Loma 70kV (Los Banos-Pacheco Wind Section) (2016 Case) Los Banos-Mercy Spring 70kV (Los Banos-Pacheco Wind Section) (2018 & Later)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	207.1%	<90%	<90%	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-80	Los Banos-Canal-Oro Loma 70kV (Canal-Ortiga Section) (2016 Case) Mercy Springs-Canal 70kV (Canal-Ortiga Section) (2018 & Later)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	129.4%	<90%	<90%	Action Plan. New Mercy Spring 230/70kV mitigates later years.
FR-SP-T-81	Los Banos-Canal-Oro Loma 70kV (Pacheco Wind-Wright Tap Section) (2016 Case) Los Banos-Mercy Spring 70kV (Pacheco Wind-Wright Tap Section) (2018 & Later)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	180.8%	<90%	<90%	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate

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Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-82	Los Banos-Canal-Oro Loma 70kV (Aruburua Tap-Wright Tap Section) (2016 Case) Los Banos-Mercy Spring 70kV (Aruburua Tap-Wright Tap Section) (2018 & Later)	Los Banos-Livingston Jct-Canal 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	174.2%	<90%	<90%	Action Plan. New Mercy Spring 230/70kV mitigates later years.
FR-SP-T-83	Oro Loma-Canal #1 70kV (Dos Palos-Santa Rita Section)	Los Banos-Canal-Oro Loma 70kV & Los Banos-Livingston Jct-Canal 70kV	C3	L-1-1	299.0%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-84	Oro Loma-Canal #1 70kV (Dos Palos-Santa Rita Section)	Mercy Spring-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	N/A	117.4%	164.5%	Upgrade limiting 1/0 Cu line
FR-SP-T-85	Oro Loma-Canal #1 70kV (Oro Loma-Dos Palos Section)	Los Banos-Canal-Oro Loma 70kV & Los Banos-Livingston Jct-Canal 70kV	C3	L-1-1	353.9%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-86	Oro Loma-Canal #1 70kV (Oro Loma-Dos Palos Section)	Mercy Spring-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	N/A	<90%	109.0%	Upgrade limiting 1/0 Cu line
FR-SP-T-87	Oro Loma-Canal #1 70kV (Santa Rita-Canal Section)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	297.1%	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-88	Oro Loma-Canal #1 70kV (Santa Rita-Canal Section)	Mercy Spring-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	N/A	165.6%	233.4%	Upgrade limiting 1/0 Cu line
FR-SP-T-89	Oro Loma #2 115/70kV	Los Banos #3 & #4 230/70kV	C3	T-1-1	350.7%	<90%	<90%	Not Solved. Use Summer Setup in Los Banos 70kV Area to mitigate
FR-SP-T-90	Sanger-Reedley 115kV (Pom Jct-Parlier Section)	Kings River-Sanger-Reedley 115kV & McCall-Reedley 115kV (McCall-Wahtoke Section)	C3	L-1-1	101.1%	<90%	<90%	Action Plan. New McCall-Reedley #2 115kV line mitigates later years.

Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-91	Sanger-Reedley 115kV (Sanger CoGen Jct-Pom Jct Section)	Kings River-Sanger-Reedley 115kV & McCall-Reedley 115kV (McCall-Wahtoke Section)	C3	L-1-1	114.8%	<90%	<90%	Action Plan. New McCall-Reedley #2 115kV line mitigates later years.
FR-SP-T-92	McCall-Reedley 115kV (Wahtoke-Reedley Section)	Kings River-Sanger-Reedley 115kV & Sanger-Reedley 115kV	C3	L-1-1	102.8%	<90%	<90%	Action Plan. New McCall-Reedley #2 115kV line mitigates later years.
FR-SP-T-93	McCall-Kingsburg #2 115kV (Guardian Jct-Kingsburg Section)	McCall-Kingsburg #1 115kV & GWF-Kingsburg 115kV	C3	L-1-1	92.4%	101.6%	113.0%	Consider SPS.
FR-SP-T-94	McCall-Kingsburg #1 115kV (Kingsburg Jct 1-Kingsburg Jct 2 Section)	McCall-Kingsburg #2 115kV & GWF-Kingsburg 115kV	C3	L-1-1	92.5%	101.7%	113.0%	Consider SPS.
FR-SP-T-95	McCall-Cal Ave 115kV (McCall-Danish Creamery Section)	Cal Ave-Sanger 115kV & McCall-West Fresno 115kV	C3	L-1-1	<90%	<90%	102.3%	Consider SPS.
FR-SP-T-96	Merced #2 115/70kV	Panoche-Mendota 115kV & Exchequer-Le Grand 115kV	C3	L-1-1	92.4%	93.8%	128.9%	Existing Exchequer SPS mitigates.
FR-SP-T-97	Merced Falls-Exchequer 70kV (McSwain-Exchequer Section)	Panoche-Mendota 115kV & Exchequer-Le Grand 115kV	C3	L-1-1	123.4%	125.1%	191.3%	Existing Exchequer SPS mitigates.
FR-SP-T-98	Merced Falls-Exchequer 70kV (Merced Falls-McSwain Jct Section)	Panoche-Mendota 115kV & Exchequer-Le Grand 115kV	C3	L-1-1	111.6%	112.9%	162.9%	Existing Exchequer SPS mitigates.
FR-SP-T-99	Merced Falls-Exchequer 70kV (Merced Falls-McSwain Jct Section)	Wilson #2 230/115 & Exchequer-Le Grand 115kV	C3	L-1/T-1	121.2%	<90%	<90%	Existing Exchequer SPS mitigates. North Merced 230/70kV mitigates later years.
FR-SP-T-100	Merced-Merced Falls 70kV	Wilson #2 230/115 & Exchequer-Le Grand 115kV	C3	L-1/T-1	109.5%	<90%	<90%	Existing Exchequer SPS mitigates. North Merced 230/70kV mitigates later years.
FR-SP-T-101	Merced-Merced Falls 70kV	Panoche-Mendota 115kV & Exchequer-Le Grand 115kV	C3	L-1-1	99.9%	99.9%	147.0%	Existing Exchequer SPS mitigates.

Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-102	Panoche-Oro Loma 115kV (DFS Tap-Oro Loma Section)	Los Banos #3 & #4 230/70kV	C3	T-1-1	142.5%	<90%	<90%	Action Plan. New Mercy Spring 230/70kV mitigates later years.
FR-SP-T-103	Panoche-Oro Loma 115kV (DFS Tap-Oro Loma Section)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	<90%	106.9%	124.7%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-104	Panoche-Oro Loma 115kV (Hammonds-DFS Tap Section)	Los Banos #3 & #4 230/70kV	C3	T-1-1	145.3%	<90%	<90%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-105	Panoche-Oro Loma 115kV (Hammonds-DFS Tap Section)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	<90%	109.9%	127.8%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-106	Panoche-Oro Loma 115kV (Panoche-Hammonds Section)	Los Banos #3 & #4 230/70kV	C3	T-1-1	157.2%	<90%	<90%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-107	Panoche-Oro Loma 115kV (Panoche-Hammonds Section)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	<90%	122.4%	141.2%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)
FR-SP-T-108	Wilson #1 230/115kV	Wilson #2 230/115 & Wilson-North Merced 230kV	C3	L-1/T-1	N/A	94.3%	109.2%	Consider SPS.
FR-SP-T-109	Wilson-Atwater #2 115kV	Atwater-Merced 115kV & El Capitan-Wilson 115kV	C3	L-1-1	138.1%	<90%	<90%	Existing Atwater SPS mitigates
FR-SP-T-110	Wilson-El Capitan 115kV	Atwater-Merced 115kV & Wilson-Atwater #2 115kV	C3	L-1-1	113.1%	<90%	<90%	Existing Atwater SPS mitigates

Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-111	Wilson-Le Grand 115kV	Wilson #1 & #2 230/115kV	C3	T-1-1	146.3%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-112	Wilson-Merced #1 115kV	Wilson-Atwater #2 115kV & El Capitan-Wilson 115kV	C3	L-1-1	136.3%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-113	Wilson-Merced #2 115kV	Wilson-Atwater #2 115kV & El Capitan-Wilson 115kV	C3	L-1-1	129.3%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-114	Wilson-Oro Loma 115kV (Le Grand Jct-El Nido Section)	Wilson #1 & #2 230/115kV	C3	T-1-1	111.4%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-115	Wilson-Oro Loma 115kV (Oro Loma-El Nido Section)	Wilson #1 & #2 230/115kV	C3	T-1-1	139.0%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-116	Wilson-Oro Loma 115kV (Wilson-Le Grand Jct Section)	Wilson #1 & #2 230/115kV	C3	T-1-1	111.4%	<90%	<90%	Action Plan. Wilson 115 kV Area Reinforcement Project mitigates later years.
FR-SP-T-117	Chowchilla-Kerckhoff 2 115kV (Sharon Tap-Oakhurst Jct Section)	Gregg-E1 #1 & #2 230kV	C5	L-2	N/A	99.9%	101.5%	Update Helms RAS & Kerckhoff 2 PH RAS
FR-SP-T-118	Los Banos-Livingston Jct-Canal 70kV (Los Banos-Chevron Pipeline Section)	Melones-Wilson 230kV & Warnerville-Wilson 230kV	C5	L-2	100.7%	<90%	<90%	Action Plan. Oro Loma 70 kV Area Reinforcement mitigates later years.
FR-SP-T-119	Panoche-Oro Loma 115kV (Panoche-Hammonds Section)	Panoche-Kearney 230kV & Gates-Gregg 230kV	C5	L-2	110.4%	<90%	<90%	Reconductor limiting section with 477 SSAC (224 MVA rating). Line is limited by 397.5 AAC (87/102MVA rating)

Study Area: **PG&E Greater Fresno - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-T-120	Warnerville-Wilson 230kV	Panoche-Kearney 230kV & Gates-Gregg 230kV	C5	L-2	100.2%	<90%	<90%	Action Plan.

Study Area: **PG&E Greater Fresno - Summer Off-Peak & Summer Light Load**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	
FR-NP-T-1	Coalinga 1-Coalinga 2 70kV (Coalinga 1-Tornado Tap Section)	Coalinga 2 70kV Bus	C1	Bus	109.6%	107.5%		Redispatch
FR-NP-T-2	Panoche-Gates #1 230kV	Gates CB312 230kV	C2	Breaker	105.6%	<90%		Redispatch

Study Area: **PG&E Greater Fresno - Summer Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-VD-1	Borden 230kV	Borden-Gregg 230kV	B	L-1	8.94%	<5%	<5%	Action Plan. Borden 230kV Voltage mitigates later years.
FR-SP-VD-2	Chowchilla 115kV (Chowchilla 115kV Area)	Le Grand-Chowchilla 115kV	B	L-1	10.95%	12.65%	13.94%	Add dynamic voltage support at Chowchilla 115kV
FR-SP-VD-3	Dairyland 115kV	Le Grand-Dairyland 115kV	B	L-1	5.70%	5.57%	6.27%	Add dynamic voltage support at Chowchilla 115kV
FR-SP-VD-4	Mendota 115kV (Mendota 115kV Area)	Panoche-Mendota 115kV	B	L-1	13.85%	<5%	<5%	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-VD-5	Angiola 70kV (Kingsburg Area)	Kingsburg-Corcoran #2 115kV	B	L-1	6.32%	6.65%	7.24%	Add dynamic voltage support at Kingsburg 115kV
FR-SP-VD-6	Dinuba 70kV (Reedley 70kV Area)	Reedley-Dinuba 70kV	B	L-1	7.87%	<5%	<5%	Action Plan. Reedly-Dinuba 70kV mitigates later years.
FR-SP-VD-7	Caruthers 70kV (Kearney 70kV Area)	Kearney #4 230/70kV	B	T-1	<5%	5.32%	<5%	Verify transformer settings at Kearney
FR-SP-VD-8	Firebaugh 70kV	Oro Loma #2 115/70kV	B	T-1	9.76%	<5%	<5%	Action Plan. Oro Loma 70kV Area Reinforcement mitigates later years.
FR-SP-VD-9	Oakhurst 115kV (Chowchilla 115kV Area)	Kerckhoff 2 115kV Bus	C1	Bus	11.49%	13.48%	14.67%	Add dynamic voltage support at Chowchilla 115kV
FR-SP-VD-10	Mendota 115kV (Mendota 115kV Area)	Panoche 1 115kV Bus	C1	Bus	13.55%	<10%	<10%	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-VD-11	Santa Nella 70kV (Los Banos 70kV Area)	Los Banos 70kV Bus	C1	Bus	83.60%	<10%	<10%	Not Solved. Oro Loma 70kV Area Reinforcement mitigates later years.
FR-SP-VD-12	Mendota 115kV (Mendota 115kV Area)	Panoche CB102 115kV Failure	C2	Breaker	17.19%	<10%	<10%	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-VD-13	Dairyland 115kV (Chowchilla 115kV Area)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	100.00%	13.50%	18.17%	Add dynamic reactive support at Mendota 115kV. Case not solved for 2016, but Oro Loma-Mendota 115kV conversion mitigates later years.
FR-SP-VD-14	Oakhurst 115kV (Chowchilla 115kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	20.75%	<10%	<10%	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.

Study Area: PG&E Greater Fresno - Summer Peak

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-VD-15	Chowchilla 115kV (Chowchilla 115kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	100.00%	15.52%	16.95%	Add dynamic reactive support at Chowchilla 115kV. Case not solved for 2016, but Oro Loma-Mendota 115kV conversion mitigates later years.
FR-SP-VD-16	Oro Loma 70kV (Los Banos 70kV Area)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	100.00%	N/A	N/A	Not Solved.
FR-SP-VD-17	Oro Loma 70kV (Los Banos 70kV Area)	Mercy Spring-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	N/A	27.67%	41.58%	Add second Mercy Spring-Oro Loma 70kV line
FR-SP-VD-18	Bear Valley 70kV (Mariposa 70kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	43.55%	<10%	<10%	Mariposa UVLS mitigates 2016. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-VD-19	Merced 70kV (Mariposa 70kV Area)	Panoche-Mendota 115kV & Exchequer-Le Grand 115kV	C3	L-1-1	<10%	<10%	11.64%	Mariposa UVLS mitigates.
FR-SP-VD-20	Mendota 115kV (Mendota 115kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	81.55%	<10%	<10%	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-VD-21	Newhall 115kV (Mendota 115kV Area)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	100.00%	10.98%	15.24%	Add dynamic reactive support at Mendota 115kV
FR-SP-VD-22	Wahtoke 115kV (Reedley 70kV Area)	McCall-Reedley 115kV (McCall-Wahtoke) & Sanger-Reedley 115kV	C3	L-1-1	12.74%	<10%	<10%	Action Plan. McCall-Reedley #2 115kV mitigates later years.
FR-SP-VD-23	West Fresno 115kV (Sanger 115kV Area)	California Ave-Sanger 115kV & McCall-West Fresno 115kV	C3	L-1-1	<10%	<10%	14.98%	Add dynamic reactive support at West Fresno 115kV
FR-SP-VD-24	Not Solved	Wilson #1 & #2 230/115kV	C3	T-1-1	Not Solved	<10%	<10%	Action Plan. Wilson 115kV Area Reinforcement mitigates later years.
FR-SP-VD-25	Not Solved	Los Banos #3 & #4 230/70kV	C3	T-1-1	Not Solved	<10%	<10%	Action Plan. Oro Loma 70kV Area Reinforcement mitigates later years.
FR-SP-VD-26	Not Solved	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	Not Solved	<10%	<10%	Mitigation alternatives under review
FR-SP-VD-27	Borden 230kV (Borden 230kV Area)	Borden-Gregg 230kV & Wilson-Gregg 230kV	C5	N-2	11.19%	<10%	<10%	Action Plan. Borden 230kV Voltage mitigates later years.

Study Area: **PG&E Greater Fresno - Summer Off-Peak & Summer Light Load**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No voltage deviation concerns identified.

Study Area: PG&E Greater Fresno - Summer Peak

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-V-1	Kearney 70kV	Base Case	A	N-0	1.07	1.09	1.08	Check xfmr taps
FR-SP-V-2	Chowchilla 115kV	Le Grand-Chowchilla 115kV	B	L-1	0.9133	0.8918	0.8733	Add dynamic voltage support at Chowchilla 115kV
FR-SP-V-3	Mendota 115kV (Mendota 115kV Area)	Panoche-Mendota 115kV	B	L-1	0.8758	>0.90	>0.90	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-V-4	Kearney 70kV	Kearney #2 230/70kV	B	T-1	<1.10	1.1157	1.1079	Check xfmr taps
FR-SP-V-5	Oakhurst 115kV (Chowchilla 115kV Area)	Kerckhoff 2 115kV Bus	C1	Bus	0.8792	0.8759	0.8626	Add dynamic voltage support at Chowchilla 115kV
FR-SP-V-6	Santa Nella 70kV (Los Banos 70kV Area)	Los Banos 70kV Bus	C1	Bus	0.1905	>0.90	>0.90	Not Solved
FR-SP-V-7	Dunlap 70kV (Reedley 70kV Area)	McCall CB202 230kV Failure	C2	Breaker	0.8858	>0.90	>0.90	Action Plan. Reedly-Orosi 70kV mitigates later years.
FR-SP-V-8	Mendota 115kV (Mendota 115kV Area)	Panoche CB102 115kV Failure	C2	Breaker	0.8722	>0.90	>0.90	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-V-9	Borden 230kV (Borden 230kV Area)	Warnerville-Wilson 230kV & Borden-Gregg 230kV	C3	L-1-1	0.8739	>0.90	>0.90	Action Plan. Borden 230kV Voltage mitigates later years.
FR-SP-V-10	Dairyland 115kV (Chowchilla 115kV Area)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	0	0.8615	0.8069	Add dynamic reactive support at Mendota 115kV. Case not solved for 2016, but Oro Loma-Mendota 115kV conversion mitigates later years.
FR-SP-V-11	Oakhurst 115kV (Chowchilla 115kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	0.8183	>0.90	>0.90	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-V-12	Chowchilla 115kV (Chowchilla 115kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	0	0.8567	0.8378	Add dynamic reactive support at Chowchilla 115kV. Case not solved for 2016, but Oro Loma-Mendota 115kV conversion mitigates later years.
FR-SP-V-13	Oro Loma 70kV (Los Banos 70kV Area)	Los Banos-Canal-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	0	N/A	N/A	Not Solved. Use Summer Setup in Los Banos 70kV Area.
FR-SP-V-14	Oro Loma 70kV (Los Banos 70kV Area)	Mercy Spring-Oro Loma 70kV & Oro Loma #2 115/70kV	C3	L-1/T-1	N/A	0.738	0.5896	Add second Mercy Spring-Oro Loma 70kV line or consider SPS.
FR-SP-V-15	Bear Valley 70kV (Mariposa 70kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	0.5919	>0.90	>0.90	Mariposa UVLS mitigates

Study Area: **PG&E Greater Fresno - Summer Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
FR-SP-V-16	Mendota 115kV (Mendota 115kV Area)	Panoche-Mendota 115kV & Wilson-Le Grand 115kV	C3	L-1-1	0	>0.90	>0.90	Action Plan. Oro Loma-Mendota 115kV project mitigates later years.
FR-SP-V-17	Newhall 115kV (Mendota 115kV Area)	Panoche-Mendota 115kV & Dairyland-Le Grand 115kV	C3	L-1-1	0	0.8769	0.8261	Add dynamic reactive support at Mendota 115kV.
FR-SP-V-18	Wahtoke 115kV (Reedley 70kV Area)	McCall-Reedley 115kV (McCall-Wahtoke) & Sanger-Reedley 115kV	C3	L-1-1	0.8928	>0.90	>0.90	Action Plan. McCall-Reedley #2 115kV mitigates later years.
FR-SP-V-19	West Fresno 115kV (Sanger 115kV Area)	California Ave-Sanger 115kV & McCall-West Fresno 115kV	C3	L-1-1	>0.90	>0.90	0.8361	Add dynamic reactive support at West Fresno 115kV
FR-SP-V-20	Borden 230kV (Borden 230kV Area)	Borden-Gregg 230kV & Wilson-Gregg 230kV	C5	N-2	0.8864	>0.90	>0.90	Action Plan. Borden 230kV Voltage mitigates later years.

Study Area: **PG&E Greater Fresno - Summer Off-Peak & Summer Light Load**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	
FR-NP-V-1	Fresno Wastewater 70kV	None	A	N-0	1.0855	1.0919		Kearney #4 230/70kV is locked.
FR-NP-V-2	Corcoran 70kV	None	A	N-0	<1.05	1.0628		Under review with PTO
FR-NP-V-3	Los Banos 70kV	None	A	N-0	<1.05	1.0631		Under review with PTO
FR-NP-V-4	Exchequer 70kV	None	A	N-0	<1.05	1.0596		Under review with PTO
FR-NP-V-5	Orosi 70kV	None	A	N-0	<1.05	1.0734		Under review with PTO
FR-NP-V-6	North Merced 115kV	None	A	N-0	<1.05	1.0577		Under review with PTO
FR-NP-V-7	Fresno Wastewater 70kV	Herndon-Kearney 230kV	B	L-1	<1.05	1.1077		Under review with PTO
FR-NP-V-8	Fresno Wastewater 70kV	Kearney #2 230/70kV	B	T-1	1.119	<1.05		Under review with PTO
FR-NP-V-9	Fresno Wastewater 70kV	Kearney #4 230/70kV	B	T-1	<1.05	1.1267		Under review with PTO

Study Area: **PG&E Greater Fresno - Summer Peak**

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No single contingency resulted in total load drop of more than 250 MW.

Study Area: **PG&E Greater Fresno - Summer Off-Peak & Summer Light Load**

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No single contingency resulted in total load drop of more than 250 MW.

Study Area: **PG&E Greater Fresno - Summer Peak**

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No single source substation with more than 100 MW Load

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No single source substation with more than 100 MW Load