

**Thermal Overloads**

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-T-1	Bridgeville - Garberville 60 kV Line #1 Between BRDGVLE - FRUTLDJT	Normal Conditions	A		103%	105%	32%	New Bridgeville - Garberville 115kVline will mitigate the overload. Adjust generation at Humboldt bay in the interim
		GEYSER # 3 - CLOVERDALE 115K (CLOVERDALE 115KV to MPE TAP115KV)	B	L-1	99%	101%	32%	
		BUS FAULT AT EGLE RCK 115 kV	C	Bus	101%	97%	33%	
		BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	107%	101%	32%	
		GEYSER # 3 - CLOVERDALE 115K line & Cortina - Mendocino No.1 115 kV Line	C	L-1-1	116%	118%	35%	
NCNB-S-T-2	Bridgeville - Garberville 60 kV Line #1 Between FRUTLDJT-FTSWRDJ	Normal Conditions	A		104%	105%	32%	New Bridgeville - Garberville 115kVline will mitigate the overload. Adjust generation at Humboldt bay in the interim
		GEYSER # 3 - CLOVERDALE 115K (CLOVERDALE 115KV to MPE TAP115KV)	B	L-1	101%	102%	32%	
		BUS FAULT AT Eagle Rock 115.0kV	C	Bus	104%	98%	33%	
		BUS FAULT AT Mendocino with 115kV breaker # CB102 stuck	C	Breaker	109%	111%	32%	
		GEYSER # 3 - CLOVERDALE 115K line & Cortina - Mendocino No.1 115 kV Line	C	L-1-1	118%	120%	35%	
NCNB-S-T-3	Bridgeville - Garberville 60 kV Line #1 Between GRBRVLE - FTSWRDJT	Normal Conditions	A		102%	103%	32%	New Bridgeville - Garberville 115kVline will mitigate the overload. Adjust generation at Humboldt bay in the interim
		GEYSER # 3 - CLOVERDALE 115K (CLOVERDALE 115KV to MPE TAP115KV)	B	L-1	99%	100%	32%	
		BUS FAULT AT Eagle Rock 115.0kV	C	Bus	102%	96%	33%	
		BUS FAULT AT Mendocino with 115kV breaker # CB102 stuck	C	Breaker	107%	109%	32%	
		GEYSER # 3 - CLOVERDALE 115K line & Cortina - Mendocino No.1 115 kV Line	C	L-1-1	117%	118%	35%	

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NCNB-S-T-4	GARBERVILLE - LAYTONVILLE 60KV Line between Garberville - Kekawaka	BUS FAULT AT Mendocino with 115kV breaker # CB102 stuck	C	Breaker	60%	59%	106%	Redispatch generation at Humboldt bay
		Eagle Rock-Cortina & Cortina-Mendocino 115kV Lines	C	L-2	58%	58%	108%	
		GEYSER # 3 - CLOVERDALE 115K line & Cortina - Mendocino No.1 115 kV Line	C	L-1-1	68%	66%	126%	
NCNB-S-T-5	GARBERVILLE - LAYTONVILLE 60KV Line between Kekawaka - Laytonville	BUS FAULT AT Mendocino with 115kV breaker # CB102 stuck	C	Breaker	60%	59%	106%	Redispatch generation at Humboldt bay
		Eagle Rock-Cortina & Cortina-Mendocino 115kV Lines	C	L-2	58%	58%	108%	
		GEYSER # 3 - CLOVERDALE 115K line & Cortina - Mendocino No.1 115 kV Line	C	L-1-1	68%	66%	126%	
NCNB-S-T-6	Geysers 3 - Cloverdale 115 kV Line #1 Between CLOVRDLE - MPE TAP	Eagle Rock-Redbud & Cortina-Mendocino 115kV Lines	C	L-2	99%	98%	103%	Geyser No. 3 - Cloverdale 115 kV switch replacement, in interim, trip Geyser 5-6 generation, and load at Ukiah for Category C
		Cortina - Mendocino No.1 115 kV Line & Eagle Rock- Cortina 115 kV Line	C	L-1-1	99%	98%	103%	
NCNB-S-T-7	Mendocino - Redbud 115 kV #1 Between LUCERNJ2 - REDBUDJ1	Geyser # 3-Cloverdale 115kV (Cloverdale-MPE Tap) & Cortina-Mendocino #1 115 kV (Mendocino Sub 1- Lucern)	C	L-1-1	98%	97%	115%	Disable the flip flop scheme at Lucerne. Drop load at Cloverdale, Ukiah and City of Ukiah as necessary if overload persists.
NCNB-S-T-8	Mendocino - Redbud 115 kV #1 Between REDBUD - REDBUDJ1	Geyser # 3-Cloverdale 115kV (Cloverdale-MPE Tap) & Cortina-Mendocino #1 115 kV (Mendocino Sub 1- Lucern)	C	L-1-1	108%	106%	126%	Disable the flip flop scheme at
NCNB-S-T-9	Eagle Rock - Redbud 115 kV #1 Between REDBUD - REDBUDJ2	Geyser # 3-Cloverdale 115kV (Cloverdale-MPE Tap) & Cortina-Mendocino #1 115 kV (Mendocino Sub 1- Lucern)	C	L-1-1	119%	118%	141%	

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NCNB-S-T-10	Eagle Rock - Redbud 115 kV #1 Between REDBUDJ2 - CACHE J2	Geyser # 3-Cloverdale 115kV (Cloverdale-MPE Tap) & Cortina-Mendocino #1 115 kV (Mendocino Sub 1- Lucern)	C	L-1-1	109%	108%	129%	Lucerne. Trip load at Redbud & Lucerne for second contingency. If overload persists drop load at Ukiah, City of Ukiah and cloverdale as necessary.
NCNB-S-T-11	Eagle Rock - Redbud 115 kV #1 Between HGHLNDJ1 - LWRLAKEJ	Geyser # 3-Cloverdale 115kV (Cloverdale-MPE Tap) & Cortina-Mendocino #1 115 kV (Mendocino Sub 1- Lucern)	C	L-1-1	120%	119%	141%	
NCNB-S-T-12	Eagle Rock - Redbud 115 kV #1 Between HGHLNDJ1 - CACHE J2	Geyser # 3-Cloverdale 115kV (Cloverdale-MPE Tap) & Cortina-Mendocino #1 115 kV (Mendocino Sub 1- Lucern)	C	L-1-1	102%	101%	120%	
NCNB-S-T-13	Fulton - Santa Rosa 115 kV Line #1 Between FULTON - MONROE1	Fulton-Santa Rosa 115 kV #2 & Corona-Lakeville 115 kV #1	C	L-1-1	112%	119%	131%	trip load at Monroe 2 115 kV
NCNB-S-T-14	Fulton - Santa Rosa 115 kV Line #2 Between FULTON - MONROE2		C	L-1-1	112%	119%	131%	
NCNB-S-T-15	Mendocino - Clear Lake 60 kV Line #1 between Mendocino - Upper Lake	Eagle Rock 115/60 kV & Clear Lake-Hopland Jct 60 kV #1	C	L-1/T-1	161%	59%	66%	Middletown 115 kV Project. In interim, open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake and Calistoga 60 kV with second contingency if overload persists
NCNB-S-T-16	Mendocino - Clear Lake 60 kV Line #1 Between Upper Lake-Hartley		C	L-1/T-1	149%	50%	55%	
NCNB-S-T-17	Mendocino - Clear Lake 60 kV Between Hartley-Clear Lake		C	L-1/T-1	110%	15%	16%	
NCNB-S-T-18	Clear Lake-Hopland between Clear Lake-Granite 60 kV	Eagle Rock - Konocti Jct 60kV line	B	L-1	109%	109%	44%	Middletown 115 kV Project. In interim, open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake 60 kV with second contingency if overload persists
		Bus Fault at Eagle Rock 115.0 kV	C	Bus	113%	45%	48%	
		Mendocino - Clearlake 60 kV Line & Eagle Rock - Konocti Jct 60kV line	C	L-1-1	154%	35%	38%	
NCNB-S-T-19	Clear Lake-Hopland between Granite-Hopland 60 kV	Eagle Rock - Konocti Jct 60kV line	B	L-1	118%	47%	52%	
		Bus Fault at Eagle Rock 115.0 kV	C	Bus	122%	53%	56%	
		Mendocino - Clearlake 60 kV Line & Eagle Rock - Konocti Jct 60kV line	C	L-1-1	162%	43%	46%	

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NCNB-S-T-20	Clear Lake - Eagle Rock 60 kV Line #1 Between CLER LKE - KONOCTI6	GEYSER # 3 - CLOVERDALE 115K (CLOVERDALE 115KV to MPE TAP115KV)	B	L-1	75%	94%	101%	PG&E Action Plan. Open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake 60 kV with second contingency if overload persists
		BUS FAULT AT MENDOCNO 115kV breaker # CB102 stuck	C	Breaker	84%	106%	116%	
		Eagle Rock-Redbud & Cortina-Mendocino 115kV Lines	C	L-2	82%	105%	112%	
		GEYSER # 3 - CLOVERDALE 115K Line & Cortina - Mendocino #1 115 kV Line	C	L-1-1	118%	145%	193%	
NCNB-S-T-21	Clear Lake - Eagle Rock 60 kV Line #1 Between KONOCTI6 - EGLE RCK	Geyser # 3-Cloverdale 115kV (Cloverdale- MPE Tap) & Eagle Rock- Cortina (Lower Lake) 115 kV	C	L-1-1	126%	96%	101%	
NCNB-S-T-22	KONOCTI-LOWER LAKE 60 kV	Eagle Rock - Cortina (Homestake) 115 kV and Fulton - Calistoga 60 kV	C	L-1-1	<95%	96%	105%	trip load at Calistoga
NCNB-S-T-23	Monte Rio- Fulton 60 KV between TRNTN JT - FULTON	Fulton- Molino- Cotati 60 kV(Molino sub 60 kV to Molino Jct 60 kV)	B	L-1	84%	89%	100%	Existing scheme to close the Molino - Trenton Jct section for the loss of Fulton-Molino-Cotati line. Line will not overload if load is not transferred
NCNB-S-T-24	Fulton - Pueblo 115 kV Line #1 Between PUEBLO - PUEBLOJT	Lakeville 115 kV CB102 stuck	C	Breaker	93%	99%	110%	trip load at Pueblo 115 kV (existing Sonoma-Pueblo SPS)
		Lakeville- Sonoma No.1 115 KV & Lakeville- Sonoma No.2 115 KV	C	L-1-1	93%	99%	109%	
		Lakeville-Sonoma #1 & #2 115kV Lines	C	L-2	93%	99%	109%	
NCNB-S-T-25	Ignacio - San Rafael #.3 115 kV (between Ignacio and Las Gallinas)	Ignacio-San Rafael #2 & Ignacio-San Rafael #1 115kV	C	L-1-1	N/A	109%	115%	Ignacio-Alto Voltage Conversion project

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NCNB-S-T-26	Ignacio-San Rafael 115 kV # 1	Ignacio - San Rafael No.3 115 kV ( Ignacio - Las Gallinas) & Ignacio-San Rafael #2 115kV line	C	L-1-1	N/A	113%	119%	Ignacio-Alto Voltage Conversion project
NCNB-S-T-27	Ignacio-San Rafael 115 kV # 2	Ignacio - San Rafael No.3 115 kV ( Ignacio 115 kv to Las Gallinas sub 115 kv) & Ignacio - San Rafael No. 3 115 kV	C	L-1-1	N/A	N/A	130%	Ignacio-Alto Voltage Conversion project
NCNB-S-T-28	Ignacio - Alto 60 kV Line #1 Between IG JCT - SAN RFLJ - GREENBRE 60 kV	Ignacio - Alto - Saulsalito # 2 60 kV & Ignacio - Alto - Saulsalito # 1 60 kV	C	L-1-1	125%	N/A	N/A	Ignacio-Alto Voltage Conversion project. In the interim, drop load at Alto
NCNB-S-T-29	Ignacio - Alto 60 kV Line #1 Between IG JCT - SAN RFLJ - GREENBRE 60 kV		C	L-1-1	125%	N/A	N/A	Ignacio-Alto Voltage Conversion project. In the interim, drop load at Alto
NCNB-S-T-30	San Rafael - Greenbrae 115kV line	Ignacio A 115/60kV bank & Ignacio B 115/60.00 kV Bank	C	T-1-1	N/A	121%	125%	Ignacio - Alto Voltage conversion project.
NCNB-S-T-31	Bridgeville - Garberville 60kV between Bridgeville - Fruitland jct		D	Loss of Substation	102%	105%	33%	Under Review
NCNB-S-T-32	Bridgeville - Garberville 60kV between Fruitland Jct - Fort Seward Jct		D	Loss of Substation	104%	106%	26%	Under Review
NCNB-S-T-33	Bridgeville - Garberville 60kV between Fort Seward Jct - Garberville		D	Loss of Substation	102%	104%	24%	Under Review
NCNB-S-T-34	Garberville - Laytonville 60kV between Garberville - Kekawaka		D	Loss of Substation	52%	52%	102%	Under Review
NCNB-S-T-35	Garberville - Laytonville 60kV between kekawaka - Lytonville		D	Loss of Substation	52%	52%	102%	Under Review

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NCNB-S-T-36	Eagle Rock - Fulton - Silverado 115kV Between Eagle Rock - ERFT5_25	Loss of Fulton 230kV station + Xfmsr	D	Loss of Substation	102%	94%	104%	Under Review
NCNB-S-T-37	Lakeville - Santa Rosa 115kV line Between SNTA RSA - STNY PTP		D	Loss of Substation	85%	86%	106%	Under Review
NCNB-S-T-38	Lakeville - Santa Rosa 115kV line Between STNY PTP - BELLVUE		D	Loss of Substation	85%	87%	107%	Under Review
NCNB-S-T-39	Lakeville - Santa Rosa 115kV line Between BELLVUE - PENNGRVE		D	Loss of Substation	109%	113%	137%	Under Review
NCNB-S-T-40	Lakeville - Santa Rosa 115kV line Between PENNGRVE - CORONA		D	Loss of Substation	114%	118%	143%	Under Review
NCNB-S-T-41	Lakeville - Santa Rosa 115kV line Between CORONA - Lakeville		D	Loss of Substation	108%	112%	135%	Under Review
NCNB-S-T-42	Sonoma - Pueblo 115kV line		D	Loss of Substation	103%	107%	127%	Under Review
NCNB-S-T-43	Monte Rio - Fulton 60kV between WHLR JCT - MONTE RO		D	Loss of Substation	75%	81%	106%	Under Review
NCNB-S-T-44	Fulton - Molino - Cotati 60kV between MLNO JCT - Fulton		D	Loss of Substation	81%	86%	104%	Under Review
NCNB-S-T-45	Lakeville - Sobrante 230kV between Crockett - Ignacio		D	Loss of Substation	107%	114%	124%	Under Review
NCNB-S-T-46	Bridgeville - Garberville 60kV between Bridgeville - Fruitland jct		D	Loss of Substation	104%	109%	33%	Under Review
NCNB-S-T-47	Bridgeville - Garberville 60kV between Fruitland Jct - Fort Seward Jct		D	Loss of Substation	56%	55%	103%	Under Review

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NCNB-S-T-48	Bridgeville - Garberville 60kV between Fort Seward Jct - Garberville	Loss of Lakeville 230kV station + Xfmrs	D	Loss of Substation	55%	55%	103%	Under Review
NCNB-S-T-49	Garberville - Laytonville 60kV between Garberville - Kekawaka		D	Loss of Substation	106%	110%	26%	Under Review
NCNB-S-T-50	Garberville - Laytonville 60kV between kekawaka - Lytonville		D	Loss of Substation	105%	108%	24%	Under Review
NCNB-S-T-51	Eagle Rock - Fulton - Silverado 115kV Between Eagle Rock - ERFT5_25		D	Loss of Substation	103%	96%	94%	Under Review
NCNB-S-T-52	Eagle Rock - Cortina 115kV line between CACHE J1 - TAPP1015		D	Loss of Substation	76%	97%	104%	Under Review



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NCNB-W-T-1	Mendocino - Clear Lake 60 kV Line #1 between Mendocino - Upper Lake	Clear Lake- Hopland 60 Kv & Eagle Rock 60kV - Konocti6 60kV	C	L-1-1	188%	37%	42%	Middletown 115 kV Project. In interim, open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake and Calistoga 60 kV with second contingency if overload persists
NCNB-W-T-2	Mendocino - Clear Lake 60 kV Line #1 Between Upper Lake-Hartley		C	L-1-1	180%	32%	36%	
NCNB-W-T-3	Mendocino - Clear Lake 60 kV Between Hartley-Clear Lake		C	L-1-1	133%	7%	9%	
NCNB-W-T-4	Elk 60kV - Philo 60kV	Mendocino- Willits- Fort Bragg 60 kV & Monte Rio- Fulton 60 KV	C	L-1-1	88%	94%	Diverged	Drop Load at Gaulala
NCNB-W-T-5	Clear Lake - Eagle Rock 60 kV Line #1 Between CLER LKE - KONOCTI6	GEYSER # 3 - CLOVERDALE 115K & Eagle Rock- Cortina 115 kV	C	L-1-1	106%	118%	121%	PG&E Action Plan. Open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake 60 kV with second contingency if overload persists
NCNB-W-T-6	Clear Lake - Eagle Rock 60 kV Line #1 Between KONOCTI6 - EGGLE RCK		C	L-1-1	105%	86%	89%	
NCNB-W-T-7	Lakeville #2 60kV Line #1 between Lakevl_JCT - PETLMA A	Fulton- Molino- Cotati 60 kV & Lakeville - Petaluma 60kV	C	L-1-1	103%	107%	117%	trip load at Petaluma A or C 60 kV (Existing SPS)
NCNB-W-T-8	Ignacio - San Rafael #.3 115 kV (between Ignacio and Las Gallinas)	Ignacio-San Rafael #2 & Ignacio-San Rafael #1 115kV Lines	C	L-1-1	N/A	106%	109%	Ignacio-Alto Voltage Conversion project
NCNB-W-T-9	Ignacio - San Rafael #.3 115 kV (between Las Gallinas and San Rafael)		C	L-1-1	N/A	104%	106%	Ignacio-Alto Voltage Conversion project
NCNB-W-T-10	Ignacio-San Rafael 115 kV #1	Ignacio - San Rafael No.3 115 kV ( Ignacio - Las Gallinas) & Ignacio-San Rafael #2 115kV line	C	L-1-1	N/A	120%	124%	Ignacio-Alto Voltage Conversion project



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NCNB-W-T-11	Ignacio - Alto 60 kV Line #1 Between IG JCT - SAN RFLJ - GREENBRE 60 kV	Ignacio-Alto-Sausalito 60kV #2 & Ignacio-Alto-Sausalito 60kV #1	C	L-1-1	143%	N/A	N/A	Ignacio-Alto 60 kV Voltage Conversion Project. In interim, trip load at Alto 60 kV
NCNB-W-T-12	Ignacio - Alto -Sausalito 60 kV # 2 Between HMLTN FD - ALTO JT2	San Rafael - Green Brae 115kV & Ignacio - Alto - Sausalito # 1 60 kV	C	L-1-1	N/A	107%	108%	Ignacio-Alto 60 kV Voltage Conversion Project. In interim, trip load at Alto 60 kV for Category C contingencies
NCNB-W-T-13	Ignacio - Alto -Sausalito 60 kV # 1 Between ALTO JT1- HMLTN FDB	Ignacio _Alto 60 kV & Ignacio - Alto - Saulsalito # 2 60 kV	C	L-1-1	115%	N/A	N/A	
NCNB-W-T-14	Ignacio-San Rafael 115 kV # 2	Ignacio - San Rafael No.3 115 kV ( Ignacio 115 kv to Las Gallinas sub 115 kv) & Ignacio - San Rafael No. 3 115 kV	C	L-1-1	N/A	102%	104%	Ignacio - Alto Voltage conversion project
NCNB-W-T-15	San Rafael - Greenbrae 115kV line	Ignacio A 115/60kV bank & Ignacio B 115/60.00 kV Bank	C	T-1-1	N/A	112%	113%	Ignacio - Alto Voltage conversion project
NCNB-W-T-16	Greenbrae 60kV - Alto 60kV		C	T-1-1	N/A	114%	115%	Ignacio - Alto Voltage conversion project
NCNB-W-T-17	Ignacio A 60kV - Ignacio B 60kV	Ignacio _Bolas No. 2 60 kV & Ignacio A 115kV / 60kV transformer	C	L-1/T-1	104%	54%	55%	Ignacio - Alto Voltage conversion project

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					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-T-1	Eagle Rock Cortina 115kV line between Eagle Rock 115kV - Homstk Tap 115kV	Eagle Rock- Fulton- Silverado 115 kV	B	L-1	102%	81%	N/A	Adjust Generation at Geysers
		Fulton-Hopland 60kv & Geysers #17-Fulton 230kv & Eagle Rock-Fulton-Silverado 115kV	C	L-2	114%	88%	N/A	
		Cortina - Mendocino No.1 115 kV & Eagle Rock-Fulton- Silverado 115 kV	C	L-1-1	128%	90%	N/A	
NCNB-OP-T-2	Eagle Rock Cortina 115kV line between Homestk Tap 115kV - Highland Jct2 115kV	Eagle Rock- Fulton- Silverado 115 kV	B	L-1	101%	60%	N/A	
		Fulton-Hopland 60kv & Geysers #17-Fulton 230kv & Eagle Rock-Fulton-Silverado 115kV	C	L-2	114%	65%	N/A	
		Cortina - Mendocino No.1 115 kV & Eagle Rock-Fulton- Silverado 115 kV	C	L-1-1	127%	69%	N/A	
NCNB-OP-T-3	Eagle Rock Cortina 115kV line between Cache J1 115kV - TAPP1015 115kV	Cortina - Mendocino No.1 115 kV & Eagle Rock-Fulton- Silverado 115 kV	C	L-1-1	111%	59%	N/A	Adjust generation at RSP 1015
NCNB-OP-T-4	Eagle Rock Cortina 115kV line between TAPP1015 115kV - Cortina 115kV	Eagle Rock- Fulton- Silverado 115 kV	B	L-1	112%	61%	N/A	Adjust generation at RSP 1015 / Geysers
		Fulton 115 kV Bus Section 2D	C	Bus	105%	52%	N/A	
		Fulton 115 kV CB342 stuck	C	Breaker	104%	51%	N/A	
		Fulton-Hopland 60kv & Geysers #17-Fulton 230kv & Eagle Rock-Fulton-Silverado 115 kV	C	L-2	123%	65%	N/A	
		Cortina - Mendocino No.1 115 kV & Eagle Rock-Fulton- Silverado 115 kV	C	L-1-1	135%	69%	N/A	
NCNB-OP-T-5	Mendocino - Hopland 60kV between Philo Jct 60kV - Hopland JCT 60kV	Ukiah-Hopland-Cloverdale 115 kV (between Ukiah - City of Ukiah 115kv) & Geyser #3 - Eagle Rock 115 kV	C	L-1-1	109%	75%	N/A	Adjust generation at Geysers

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NCNB-OP-T-6	Hopland JCT 60kV - Cloverdale Jct 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	159%	N/A	Close the tie line between Petaluma C jct and Cotati sub. Drop load at Cotati.
NCNB-OP-T-7	Cloverdale Jct 60kV - Geyser Jct1 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	150%	N/A	
NCNB-OP-T-8	Geyser Jct1 60kV - Fitch MntnP 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	151%	N/A	
NCNB-OP-T-9	Fulton 60kV - St.Helna 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	135%	N/A	
NCNB-OP-T-10	St.Helna 60kV - Calistga 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	165%	N/A	
NCNB-OP-T-11	Calistga 60kV - Middltnw 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	N/A	183%	N/A	
NCNB-OP-T-12	Hopland Jct 115 kV / 60kV Transformer	Ukiah-Hopland-Cloverdale 115 kV (between Ukiah - City of Ukiah 115kv) & Geyser #3 - Eagle Rock 115 kV	C	L-1-1	247%	172%	N/A	Adjust generation at Geysers
NCNB-OP-T-13	Eagle Rock - Cortina 115kV between Eagle rock and Homestk tap	Common Corridor between Eagle Rock - Fulton	D	Loss of all lines in a ROW	110%	85%	N/A	Under Review
NCNB-OP-T-14	Eagle Rock - Cortina 115kV line between Homestk tap - Highland Jct	Common Corridor between Eagle Rock - Fulton	D	Loss of all lines in a ROW	109%	81%	N/A	Under Review

**Thermal Overloads**

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-T-15	Eagle Rock - Cortina 115kV line between Tap 1015 - Cortina	Common Corridor between Eagle Rock - Fulton	D	Loss of all lines in a ROW	119%	80%	N/A	Under Review

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and Bay - Summer Peak**

## Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-DV-1	ALTO 60kV	Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	-11.07%	-1.13%	-1.23%	Ignacio - Alto voltage conversion project
NCNB-S-DV-2	CALISTGA 60kV	LAKEVILLE #1 60 kV(Lakeville sub 60 kV to Dunbar Sub 60 kV)	B	L-1	-5.91%	-2.24%	-2.56%	Middle town 115kV project
		Homestk Tp - Middletown 115kV	B	L-1	N/A	-4.96%	-5.82%	
		Middletown 115/60kV transformer	B	T-1	N/A	-4.95%	-5.81%	
NCNB-S-DV-3	CLER LKE 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	-11.13%	-2.44%	-2.84%	
		BUS FAULT AT EGLE RCK 115kV	C	Bus	-11.55%	-3.55%	-2.64%	
		BUS FAULT AT EGLE RCK 60kV	C	Bus	-11.13%	-2.43%	-2.84%	
NCNB-S-DV-4	CLOVRDLE 115kV	GEYSER #3 - CLOVERDALE 115K (CLOVERDALE 115KV to MPE TAP115KV)	B	L-1	-3.61%	-3.70%	-5.23%	Adjust generation at geysers
NCNB-S-DV-5	COVELO6 60kV	LYTNVILLE - COVELO6 60kV	B	L-1	1.73%	2.47%	5.97%	Garberville reactive support project
		BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	-7.62%	-7.32%	-10.41%	
NCNB-S-DV-6	DUNBAR 60kV	LAKEVILLE #1 60 kV(Lakeville sub 60 kV to Dunbar Sub 60 kV)	B	L-1	-6.81%	-2.62%	-3.31%	Middle town 115kV project
NCNB-S-DV-7	EGLE RCK 60kV	EAGLE ROCK 115/60 KV BANK NO.1	B	T-1	-11.83%	-6.34%	-7.18%	open Eagle Rock-Konocti 60 kV line for Eagle Rock bank outage
		BUS FAULT AT EGLE RCK 115kV	C	Bus	-22.64%	-7.36%	-7.37%	
NCNB-S-DV-8	GRANITE 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	-9.28%	-1.98%	-2.33%	Middle town 115kV project
NCNB-S-DV-9	HARTLEY 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	-9.70%	-2.11%	-2.47%	
		BUS FAULT AT EGLE RCK 115kV	C	Bus	-10.07%	-3.37%	-2.22%	
NCNB-S-DV-10	HOMSTKTP 115kV	BUS FAULT AT HOMSTKTP 115kV	C	Bus	-1.69%	-13.75%	-14.49%	Adjust generation near Eagle Rock / Homestk Tap
		Eagle Rock-Cortina & Cortina-Mendocino 115kV Lines	C	L-2	-1.69%	-13.81%	-14.61%	
		Eagle Rock-Redbud & Eagle Rock-Cortina 115kV Lines	C	L-2	-1.69%	-14.01%	-14.14%	

## Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-DV-11	KONOCI6 60kV	Eagle Rock - KONOCI6 60kV	B	L-1	-18.85%	-4.53%	-5.19%	Middle town 115kV project
		BUS FAULT AT EGLE RCK 115kV	C	Bus	-19.27%	-5.30%	-5.02%	
		BUS FAULT AT EGLE RCK 60kV	C	Bus	-18.85%	-4.52%	-5.19%	
		EAGLE ROCK 115/60 KV BANK NO.1	B	T-1	-8.46%	-4.28%	-4.83%	
NCNB-S-DV-12	LOWR LKE 60kV	Eagle Rock - KONOCI6 60kV	B	L-1	-19.46%	-2.93%	-3.44%	
		BUS FAULT AT EGLE RCK 115kV	C	Bus	-19.91%	-3.47%	-3.32%	
		BUS FAULT AT EGLE RCK 60kV	C	Bus	-19.46%	-2.92%	-3.44%	
		EAGLE ROCK 115/60 KV BANK NO.1	B	T-1	-6.50%	-2.64%	-3.02%	
NCNB-S-DV-13	MIDDLTWN 60kV	Eagle Rock - KONOCI6 60kV	B	L-1	-20.35%	-0.18%	-0.41%	
		BUS FAULT AT EGLE RCK 115kV	C	Bus	-20.82%	-0.35%	-0.38%	
		BUS FAULT AT EGLE RCK 60kV	C	Bus	-20.35%	-0.18%	-0.41%	
		Homestk Tp - Middletown 115kV	B	L-1	N/A	-6.90%	-8.05%	
		Middletown 115/60kV transformer	B	T-1	N/A	-6.89%	-8.03%	
NCNB-S-DV-14	MIDDLTWN 115kV	BUS FAULT AT HOMSTKTP 115kV	C	Bus	N/A	-12.31%	-12.82%	
		Eagle Rock-Cortina & Cortina-Mendocino 115kV Lines	C	L-2	N/A	-12.37%	-12.94%	
		Eagle Rock-Redbud & Eagle Rock-Cortina 115kV Lines	C	L-2	N/A	-12.57%	-12.47%	
		Homestk Tp - Middletown 115kV	B	L-1	N/A	-12.54%	-13.03%	
NCNB-S-DV-15	MNDCNO M 115kV	BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	-6.91%	-6.87%	-11.92%	Install a series breaker to 115kV CB102 at Mendocino
NCNB-S-DV-16	PTTR VLY 60kV	BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	-6.26%	-6.17%	-11.32%	
NCNB-S-DV-17	PUEBLO 115kV	Lakeville 115 kV CB102 stuck	C	Breaker	-9.15%	-8.90%	-11.80%	Trip load at Pueblo by existing SPS
		Lakeville-Sonoma #1 & #2 115kV Lines	C	L-2	-8.38%	-9.41%	-10.72%	
NCNB-S-DV-18	RPSP1015 115kV	Eagle rock – Cortina 115kV line (Between Highland Jct - Cortina)	B	L-1	-5.66%	-5.59%	-5.47%	Adjust generation near Eagle Rock / Homestk Tap
NCNB-S-DV-19	SONOMA 115kV	Lakeville 115 kV CB102 stuck	C	Breaker	-12.15%	-12.16%	-15.39%	Trip load at Pueblo by existing SPS
		Lakeville-Sonoma #1 & #2 115kV Lines	C	L-2	-11.36%	-12.68%	-14.28%	
NCNB-S-DV-21	UPPR LKE 60kV	Eagle Rock - KONOCI6 60kV	B	L-1	-8.13%	-1.75%	-2.06%	Middle town 115kV project

# 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and Bay - Summer Peak**

## Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-DV-22	WILLITS 60kV	BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	-6.39%	-6.21%	-11.62%	Install a series breaker to 115kV CB102 at Mendocino
		Mendocino- Willits- Fort Bragg 60 kV(Mendocino sub 60kV to Willits Jct 60 kV)	B	L-1	4.04%	4.25%	6.22%	Garberville reactive support project
NCNB-S-DV-23	FULTON		D	Loss of Substation	-20.30%	-20.04%	-26.16%	Under Review
NCNB-S-DV-24	MONROE1		D	Loss of Substation	-19.06%	-18.81%	-24.76%	Under Review
NCNB-S-DV-25	MONROE2		D	Loss of Substation	-19.08%	-18.83%	-24.78%	Under Review
NCNB-S-DV-26	SNTA RSA		D	Loss of Substation	-18.48%	-18.24%	-24.09%	Under Review
NCNB-S-DV-27	STONY PT		D	Loss of Substation	-16.86%	-16.61%	-22.07%	Under Review
NCNB-S-DV-28	BELLVUE		D	Loss of Substation	-16.04%	-15.79%	-21.05%	Under Review
NCNB-S-DV-29	PENNGRVE		D	Loss of Substation	-13.47%	-13.19%	-17.70%	Under Review
NCNB-S-DV-30	RINCON		D	Loss of Substation	-18.04%	-17.80%	-23.21%	Under Review
NCNB-S-DV-31	GUALALA		D	Loss of Substation	-19.91%	-20.51%	-30.88%	Under Review
NCNB-S-DV-32	ANNAPOLS		D	Loss of Substation	-19.30%	-19.84%	-29.33%	Under Review
NCNB-S-DV-33	FORT RSS		D	Loss of Substation	-18.92%	-19.42%	-28.34%	Under Review
NCNB-S-DV-34	SLMN CRK		D	Loss of Substation	-18.79%	-19.27%	-27.92%	Under Review



## Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-DV-35	MONTE RO	Loss of Fulton 230kV station + Xfmrs	D	Loss of Substation	-18.25%	-18.67%	-26.67%	Under Review
NCNB-S-DV-36	WOHLER		D	Loss of Substation	-17.15%	-17.43%	-24.15%	Under Review
NCNB-S-DV-37	MIRABEL		D	Loss of Substation	-17.35%	-17.66%	-24.62%	Under Review
NCNB-S-DV-38	MOLINO		D	Loss of Substation	-17.51%	-17.82%	-24.65%	Under Review
NCNB-S-DV-39	GYSRVLE		D	Loss of Substation	-18.01%	-18.43%	-25.76%	Under Review
NCNB-S-DV-40	GYSR 1-2		D	Loss of Substation	-17.91%	-18.32%	-25.56%	Under Review
NCNB-S-DV-41	FULTON		D	Loss of Substation	-16.69%	-16.92%	-23.10%	Under Review
NCNB-S-DV-42	FTCH MTN		D	Loss of Substation	-17.85%	-18.25%	-25.45%	Under Review
NCNB-S-DV-43	LAGUNA		D	Loss of Substation	-17.69%	-18.01%	-24.99%	Under Review
NCNB-S-DV-44	COTATI		D	Loss of Substation	-17.86%	-18.21%	-25.34%	Under Review
NCNB-S-DV-45	SNMALDFL		D	Loss of Substation	-17.83%	-18.17%	-25.29%	Under Review
NCNB-S-DV-46	SILVERDO		D	Loss of Substation	-16.67%	-16.45%	-21.46%	Under Review
NCNB-S-DV-47	MONTCLLO		D	Loss of Substation	-16.65%	-16.43%	-21.44%	Under Review
NCNB-S-DV-48	MNTCLOPH		D	Loss of Substation	-16.63%	-16.41%	-21.41%	Under Review
NCNB-S-DV-49	PUEBLO		D	Loss of Substation	-13.12%	-12.83%	-17.16%	Under Review
NCNB-S-DV-50	ST.HELNA		D	Loss of Substation	-17.55%	-11.67%	-16.45%	Under Review

## Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	
NCNB-W-DV-1	ALTO 60kV	Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	-17.19%	-1.33%	-1.36%	Ignacio - Alto Voltage conversion project
NCNB-W-DV-2	EGLE RCK 60kV	EAGLE ROCK 115/60 KV BANK NO.1	B	T-1	-10.11%	-5.32%	-6.01%	Open Eagle Rock-Konocti 60 kV line for Eagle Rock bank outage
		BUS FAULT AT EGLE RCK 115.00	C	Bus	-13.06%	-4.91%	-5.83%	
NCNB-W-DV-3	GREENBRE 60kV	Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	-15.17%	-0.15%	-0.18%	Ignacio - Alto Voltage conversion project
NCNB-W-DV-4	HOMSTKTP 115kV	BUS FAULT AT HOMSTKTP 115.00	C	Bus	-1.61%	-10.59%	-11.01%	Adjust generation near Eagle Rock / Homestk Tap
		Eagle Rock-Cortina & Cortina-Mendocino 115kV Lines	C	L-2	-1.61%	-10.65%	-10.92%	
		Eagle Rock-Redbud & Eagle Rock-Cortina 115kV Lines	C	L-2	-1.61%	-10.81%	-10.67%	
NCNB-W-DV-5	KONOCI6 60kV	EAGLE ROCK 115/60 KV BANK NO.1	B	T-1	-7.75%	-3.69%	-4.13%	Middletown 115kV project
		BUS FAULT AT EGLE RCK 115.00	C	Bus	-10.70%	-3.28%	-3.95%	
		BUS FAULT AT EGLE RCK 60.00	C	Bus	-11.68%	-4.13%	-4.63%	
NCNB-W-DV-6	LOWR LKE 60kV	BUS FAULT AT EGLE RCK 115.00	C	Bus	-10.82%	-2.24%	-2.68%	
		BUS FAULT AT EGLE RCK 60.00	C	Bus	-11.82%	-2.93%	-3.30%	
NCNB-W-DV-7	MIDDLTWN 60kV	BUS FAULT AT EGLE RCK 115.00	C	Bus	-11.01%	-0.50%	-0.54%	
		BUS FAULT AT EGLE RCK 60.00	C	Bus	-12.03%	-0.91%	-1.05%	
NCNB-W-DV-8	MIDDLTWN 115kV	BUS FAULT AT HOMSTKTP 115.00	C	Bus	N/A	-9.71%	-10.05%	
		HomeStk Tp - Middletown 115kV	B	L-1	N/A	-9.97%	-10.33%	
NCNB-W-DV-9	FULTON		D	Loss of Substation	-13.46%	-13.63%	-17.08%	Under Review
NCNB-W-DV-10	MONROE1		D	Loss of Substation	-12.54%	-12.67%	-15.96%	Under Review
NCNB-W-DV-11	MONROE2		D	Loss of Substation	-12.54%	-12.68%	-15.98%	Under Review
NCNB-W-DV-12	SNTA RSA		D	Loss of Substation	-12.12%	-12.23%	-15.45%	Under Review
NCNB-W-DV-13	STONY PT		D	Loss of Substation	-11.01%	-11.06%	-14.05%	Under Review

## Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	
NCNB-W-DV-14	BELLVUE	Loss of Fulton 230kV station + Xfmrs	D	Loss of Substation	-10.45%	-10.48%	-13.35%	Under Review
NCNB-W-DV-15	PENNGRVE		D	Loss of Substation	-8.77%	-8.73%	-11.18%	Under Review
NCNB-W-DV-16	RINCON		D	Loss of Substation	-11.88%	-12.02%	-15.09%	Under Review
NCNB-W-DV-17	GUALALA		D	Loss of Substation	-10.64%	-11.80%	-16.66%	Under Review
NCNB-W-DV-18	ANNAPOLS		D	Loss of Substation	-10.35%	-11.42%	-15.86%	Under Review
NCNB-W-DV-19	FORT RSS		D	Loss of Substation	-10.17%	-11.18%	-15.36%	Under Review
NCNB-W-DV-20	SLMN CRK		D	Loss of Substation	-10.07%	-11.05%	-15.06%	Under Review
NCNB-W-DV-21	MONTE RO		D	Loss of Substation	-9.87%	-10.79%	-14.58%	Under Review
NCNB-W-DV-22	WOHLER		D	Loss of Substation	-9.43%	-10.25%	-13.57%	Under Review
NCNB-W-DV-23	MIRABEL		D	Loss of Substation	-9.52%	-10.35%	-13.75%	Under Review
NCNB-W-DV-24	MOLINO		D	Loss of Substation	-9.68%	-10.52%	-13.87%	Under Review
NCNB-W-DV-25	GYSRVILLE		D	Loss of Substation	-9.76%	-10.64%	-14.10%	Under Review
NCNB-W-DV-26	GYSR 1-2		D	Loss of Substation	-9.73%	-10.59%	-14.03%	Under Review
NCNB-W-DV-27	FULTON		D	Loss of Substation	-9.25%	-10.02%	-13.15%	Under Review
NCNB-W-DV-28	FTCH MTN		D	Loss of Substation	-9.71%	-10.56%	-13.99%	Under Review

**Voltage Deviations**

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	
NCNB-W-DV-29	LAGUNA		D	Loss of Substation	-9.79%	-10.65%	-14.07%	Under Review
NCNB-W-DV-30	COTATI		D	Loss of Substation	-9.85%	-10.72%	-14.19%	Under Review
NCNB-W-DV-31	SNMALDFL		D	Loss of Substation	-9.84%	-10.70%	-14.16%	Under Review
NCNB-W-DV-32	SILVERDO		D	Loss of Substation	-10.88%	-11.02%	-13.86%	Under Review
NCNB-W-DV-33	MONTCLLO		D	Loss of Substation	-10.87%	-11.01%	-13.86%	Under Review
NCNB-W-DV-34	MNTCLOPH		D	Loss of Substation	-10.86%	-10.99%	-13.84%	Under Review
NCNB-W-DV-35	PUEBLO		D	Loss of Substation	-8.60%	-8.52%	-10.90%	Under Review

## Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-DV-1	ANNAPOLS 60kV	Gualala- Monte Rio 60 kV (Gualala sub 60 kV to Annapolis Sub 60 kV)	B	L-1	-7.81%	-7.25%	N/A	Install reactive support at Annapolis / Fort Ross
		Monte Rio- Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	B	L-1	-7.81%	-7.25%	N/A	
NCNB-OP-DV-2	BIG RIVR 60kV	Mendocino- Willits- Fort Bragg 60 kV(Mendocino sub 60kV to Willits Jct 60 kV)	B	L-1	3.60%	5.22%	N/A	Garberville reactive support project
NCNB-OP-DV-3	CALISTGA 60kV	Fulton -Calistoga 60 kV (Fulton Sub 60 kV to St. Helena Jct 60 kV)	B	L-1	-6.83%	-1.29%	N/A	Middletown 115kV project
NCNB-OP-DV-4	FORT RSS 60kV	Gualala- Monte Rio 60 kV (Gualala sub 60 kV to Annapolis Sub 60 kV)	B	L-1	-7.63%	-7.07%	N/A	Install reactive support at Annapolis / Fort Ross
		Monte Rio- Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	B	L-1	-7.63%	-7.07%	N/A	
NCNB-OP-DV-5	FRT BRGG 60kV	Mendocino- Willits- Fort Bragg 60 kV(Mendocino sub 60kV to Willits Jct 60 kV)	B	L-1	4.31%	6.19%	N/A	Garberville reactive support project
NCNB-OP-DV-6	GYSR 1-2 60kV	Fulton #1 60kV (Geyserville sub 60 kV to Geyserville Jct 60 KV)	B	L-1	-6.28%	-5.83%	N/A	Adjust generation at Geysers
NCNB-OP-DV-7	GYSRVLE 60kV	Fulton #1 60kV (Geyserville sub 60 kV to Geyserville Jct 60 KV)	B	L-1	-6.29%	-5.80%	N/A	
NCNB-OP-DV-8	MIDDLTWN 115kV	Homestk TP - Middletown 115kV	B	L-1	N/A	-8.37%	N/A	Middletown 115kV project
NCNB-OP-DV-9	MIRABEL 60kV	Monte Rio- Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	B	L-1	-6.26%	-6.04%	N/A	Adjust generation at Geysers
NCNB-OP-DV-10	MNDINO M 115kV	MENDOCINO 115/60 KV BANK NO.1	B	T-1	-5.72%	-5.42%	N/A	Big river and Garberville reactive support projects
NCNB-OP-DV-11	MONTE RO 60kV	Monte Rio- Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	B	L-1	-7.09%	-6.63%	N/A	Install reactive support at Annapolis / Fort Ross
NCNB-OP-DV-12	RPSP1015 115kV	Eagle rock – Cortina 115kV line (Between Highland Jct - Cortina)	B	L-1	-5.33%	-5.55%	N/A	Adjust generation near Eagle Rock / Homestk Tap

**Voltage Deviations**

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-DV-13	SLMN CRK 60kV	Gualala- Monte Rio 60 kV (Gualala sub 60 kV to Annapolis Sub 60 kV)	B	L-1	-7.78%	-7.12%	N/A	Install reactive support at Annapolis / Fort Ross
		Monte Rio- Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	B	L-1	-7.78%	-7.12%	N/A	
NCNB-OP-DV-14	ST.HELNA 60kV	Fulton -Calistoga 60 kV (Fulton Sub 60 kV to St. Helena Jct 60 kV)	B	L-1	-5.28%	-5.51%	N/A	Middletown 115kV project
NCNB-OP-DV-15	WOHLER 60kV	Monte Rio- Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	B	L-1	-5.48%	-5.29%	N/A	

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-V-1	ALTO 60kV	Ignacio - Alto - Sausalito # 2 60 kV & Ignacio - Alto - Sausalito # 1 60 kV	C	L-1-1	0.8714	0.9981	0.9978	trip load at Alto 60 kV for Category C contingencies. Long term-Ignacio-Alto 60 kV voltage conversion
		Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	0.8714	0.9981	0.9978	
NCNB-S-V-2	CALISTGA 60kV	Fulton -Calistoga 60 kV & Middletown 115kV / 60kV transformer	C	L-1/T-1	N/A	0.8231	0.7992	Trip load at Calistoga
NCNB-S-V-3	CLER LKE 60kV	Eagle Rock 60kV - KONOCTI6 60kV	B	L-1	0.8814	0.9756	0.9605	Middletown 115kV project. In the interim Open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake 60 kV with second contingency if low voltage persists
		BUS FAULT AT EGLE RCK 115kV	C	Bus	0.8772	0.9645	0.9625	
		BUS FAULT AT EGLE RCK 60kV	C	Bus	0.8814	0.9757	0.9605	
		Mendocino -Clearlake 60 kV & Eagle Rock - KONOCTI6 60kV	C	L-1-1	0.6691	0.9551	0.9411	
NCNB-S-V-4	COVELO6 60kV	BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	0.9166	0.9122	0.8463	Garberville reactive support project
NCNB-S-V-5	EGLE RCK 60kV	BUS FAULT AT EGLE RCK 115kV	C	Bus	0.8171	0.9749	0.9717	Middletown 115 kV Project
		Clear Lake- Hopland 60 Kv & EAGLE ROCK 115/60 KV BANK NO.1	C	L-1/T-1	0.6974	0.9518	0.9338	
NCNB-S-V-6	FRT BRGG 60kV	BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	0.9774	0.9838	0.8918	Garberville reactive support project
NCNB-S-V-7	GARCIA 60kV	BUS FAULT AT MENDOCNO with 115kV breaker CB102 stuck	C	Breaker	0.9758	0.9815	0.8966	Drop load at Garcia. Long term install reactive support at Annapolis / Fort Ross.
NCNB-S-V-8	GRANITE 60kV	Mendocino -Clearlake 60 kV & Eagle Rock - KONOCTI6 60kV	C	L-1-1	0.7302	0.968	0.9548	Middletown 115 kV Project
NCNB-S-V-9	GREENBRE 60kV	Ignacio - Alto - Sausalito # 2 60 kV & Ignacio - Alto - Sausalito # 1 60 kV	C	L-1-1	0.887	1.0121	1.0121	Trip load at Alto 60 kV for Category C contingencies. Long Term: Ignacio - Alto 60 kV Voltage Conversion
		Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	0.887	1.0121	1.0121	
NCNB-S-V-10	HARTLEY 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	0.8922	0.9735	0.9571	Middletown 115 kV Project
		Bus Fault at Eagle Rck 115kV	C	Bus	0.8885	0.9609	0.9596	
		Bus Fault at Eagle Rck 60kV	C	Bus	0.8922	0.9736	0.9571	



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
		Mendocino -Clearlake 60 kV & Eagle Rock - KONOCTI6 60kV	C	L-1-1	0.6527	0.9433	0.9278	Drop load at Hartley / Upper lake
NCNB-S-V-11	HOMEGRND 115kV	Eagle Rock- Cortina 115 kV (between Eagle Rock - Homestake Sub) & Eagle Rock - Cortina 115kV (between Highland Jct - Cortina)	C	L-1-1	1.0111	0.9035	0.8923	Drop load at Homestake.
NCNB-S-V-12	HOMEPROC 115kV		C	L-1-1	1.0132	0.9034	0.8923	
NCNB-S-V-13	KONOCTI6 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	0.8212	0.9824	0.9698	Middletown 115 kV Project
		Bus Fault at Eagle Rck 115kV	C	Bus	0.817	0.9747	0.9715	
		Bus Fault at Eagle Rck 60kV	C	Bus	0.8212	0.9825	0.9698	
		Mendocino -Clearlake 60 kV & Eagle Rock - KONOCTI6 60kV	C	L-1-1	0.5621	0.9668	0.9564	
NCNB-S-V-14	LOWR LKE 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	0.796	1.0033	0.9945	Middletown 115 kV Project
		Bus Fault at Eagle Rck 115kV	C	Bus	0.7915	0.9979	0.9957	
		Bus Fault at Eagle Rck 60kV	C	Bus	0.796	1.0034	0.9945	
		Mendocino -Clearlake 60 kV & Eagle Rock - KONOCTI6 60kV	C	L-1-1	0.5141	0.9919	0.9861	
NCNB-S-V-15	LYTNVLE 60kV	BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	0.926	0.9219	0.8595	Garberville reactive support project
NCNB-S-V-16	MENDOCNO 60kV	BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	0.9572	0.9572	0.8931	
NCNB-S-V-17	MIDDLTWN 60kV	Eagle Rock - KONOCTI6 60kV	B	L-1	0.7563	1.0383	1.0361	Middle town 115 kV Project will mitigate the low voltage. In interim, open CB22 at Clear Lake and close NO CB at Middletown, trip load at Clear Lake 60 kV with second contingency if low voltage persists.
		Bus Fault at Eagle Rck 115kV	C	Bus	0.7516	1.0366	1.0364	
		Bus Fault at Eagle Rck 60kV	C	Bus	0.7563	1.0383	1.0361	
		Mendocino -Clearlake 60 kV & Eagle Rock - KONOCTI6 60kV	C	L-1-1	0.4428	1.0342	1.0367	
NCNB-S-V-18	MIDDLTWN 115kV	Eagle Rock-Cortina & Cortina-Mendocino 115kV Lines	C	L-1-1	N/A	0.8995	0.8881	Middletown 115 kV Project
		Eagle Rock-Redbud & Eagle Rock-Cortina 115kV Lines	C	L-1-1	N/A	0.8975	0.8928	

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and Bay - Summer Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-V-19	MNDCNO M 115kV	BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	0.9556	0.9556	0.8917	Install a series breaker to CB#102
NCNB-S-V-20	OLEMA 60kV	IGNACO A 115/60.00 kV BANK & IGNACO B 115/60.00 kV BANK	C	T-1-1	1.0136	0.9054	0.897	Close the NO tie line between Lakeville Jct - Novato Jct 60kV. Drop load at Novato / Stafford sub as needed.
NCNB-S-V-21	PNT ARNA 60kV	BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	0.9758	0.9815	0.8966	Drop load at Point Arena. Long term, install reactive support at Annapolis / Fort Ross.
NCNB-S-V-22	PTTR VLY 60kV	BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	0.9641	0.9641	0.896	Adjust generation near Eagle Rock / Homstk Tap
NCNB-S-V-23	SAUSALTO 60kV	Ignacio _Alto 60 kV & Ignacio - Alto - Sausalito # 2 60 kV	C	L-1-1	0.8277	N/A	N/A	Ignacio - Alto voltage conversion project. PG&E action plan in the interim.
NCNB-S-V-24	SONOMA 115kV	Lakeville 115 kV CB102 stuck	C	Breaker	0.9173	0.916	0.8857	Trip load at Pueblo by existing SPS
		Lakeville- Sonoma No.1 115 KV & Lakeville- Sonoma No.2 115 KV	C	L-1-1	0.9252	0.9108	0.8968	
		Lakeville-Sonoma #1 & #2 115kV Lines	C	Breaker	0.9252	0.9108	0.8968	
NCNB-S-V-25	WILLITS 60kV	BUS FAULT AT MENDOCNO with 115kV CB102 stuck	C	Breaker	0.9404	0.9399	0.8651	Big river SVC (Mendocino coast reactive support project).
NCNB-S-V-26	GUALALA	Common Corridor between Eagle Rock - Fulton	D	Loss of all lines in a ROW	0.93	0.95	0.89	Under review
NCNB-S-V-27	GUALALA	Common corridor south of Lakeville	D	Loss of all lines in a ROW	0.94	0.95	0.89	Under review
NCNB-S-V-28	FULTON		D	Loss of Station	0.8367	0.8372	0.7815	Under review
NCNB-S-V-29	MONROE1		D	Loss of Station	0.8374	0.8372	0.7815	Under review
NCNB-S-V-30	MONROE2		D	Loss of Station	0.8365	0.8363	0.7805	Under review

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-V-31	SNTA RSA	Loss of Fulton 230kV station + Xfmrs	D	Loss of Station	0.8396	0.8391	0.7839	Under review
NCNB-S-V-32	BELLVUE		D	Loss of Station	0.8639	0.8636	0.8135	Under review
NCNB-S-V-33	PENNGRVE		D	Loss of Station	0.8943	0.8948	0.8520	Under review
NCNB-S-V-34	RINCON		D	Loss of Station	0.8555	0.8559	0.8057	Under review
NCNB-S-V-35	GUALALA		D	Loss of Station	0.7539	0.7420	0.6134	Under review
NCNB-S-V-36	ANNAPOLS		D	Loss of Station	0.7803	0.7703	0.6563	Under review
NCNB-S-V-37	FORT RSS		D	Loss of Station	0.7949	0.7862	0.6812	Under review
NCNB-S-V-38	SLMN CRK		D	Loss of Station	0.7986	0.7902	0.6896	Under review
NCNB-S-V-39	MONTE RO		D	Loss of Station	0.8206	0.8142	0.7237	Under review
NCNB-S-V-40	WHLR TAP		D	Loss of Station	0.8686	0.8666	0.7960	Under review
NCNB-S-V-41	MIRABEL		D	Loss of Station	0.8606	0.8577	0.7834	Under review
NCNB-S-V-42	MOLINO		D	Loss of Station	0.8456	0.8425	0.7696	Under review
NCNB-S-V-43	GYSRVLE		D	Loss of Station	0.8228	0.8162	0.7363	Under review
NCNB-S-V-44	GYSR 1-2		D	Loss of Station	0.8290	0.8228	0.7443	Under review
NCNB-S-V-45	FULTON		D	Loss of Station	0.8851	0.8847	0.8220	Under review

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NCNB-S-V-46	FTCH MTN		D	Loss of Station	0.8317	0.8257	0.7479	Under review
NCNB-S-V-47	COTATI		D	Loss of Station	0.8264	0.8217	0.7438	Under review
NCNB-S-V-48	SNMALDFL		D	Loss of Station	0.8283	0.8238	0.7462	Under review
NCNB-S-V-49	ST.HELNA		D	Loss of Station	0.8426	0.9285	0.8794	Under review
NCNB-S-V-50	SILVERDO		D	Loss of Station	0.8597	0.8595	0.8122	Under review
NCNB-S-V-51	MONTCLLO		D	Loss of Station	0.8624	0.8622	0.8148	Under review
NCNB-S-V-52	MNTCLOPH		D	Loss of Station	0.8643	0.8641	0.8168	Under review
NCNB-S-V-53	PUEBLO		D	Loss of Station	0.8957	0.8959	0.8542	Under review
NCNB-S-V-54	CALISTGA		D	Loss of Station	0.8082	0.9601	0.9243	Under review
NCNB-S-V-55	STONY PT		D	Loss of Station	0.8557	0.8554	0.8035	Under review
NCNB-S-V-56	WOHLER		D	Loss of Station	0.8683	0.8663	0.7956	Under review
NCNB-S-V-57	LAGUNA		D	Loss of Station	0.8359	0.8323	0.7573	Under review

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: PG&amp;E North Coast and North Bay- Winter Peak

## High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	
NCNB-W-V-1	ALTO 60kV	Ignacio _Alto 60 kV & Ignacio - Alto - Sausalito # 2 60 kV	C	L-1-1	0.70	N/A	N/A	Ignacio - Alto voltage conversion project
		Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	0.80	0.99	0.99	
NCNB-W-V-2	BOLINAS 60kV	IGNACO A 115/60.00 kV BANK & IGNACO B 115/60.00 kV BANK	C	T-1-1	1.03	0.88	0.88	Close the NO tie line between Lakeville Jct - Novato Jct 60kV. Drop load at Novato / Stafford sub as needed.
NCNB-W-V-3	CLOVRDLE 115kV	Mendocno- Ukiah 115 kV & GEYSER # 3 - CLOVERDALE 115K	C	L-1-1	0.86	0.85	0.83	Drop load at Ukiah and City of Ukiah
NCNB-W-V-4	EGLERCK 60kV	Clear Lake- Hopland 60 Kv & EAGLE ROCK 115/60 KV BANK NO.1	C	L-1 / T-1	0.81	0.97	0.96	Middletown 115kV project.
NCNB-W-V-5	GREENBRE 60kV	Ignacio _Alto 60 kV & Ignacio - Alto - Sausalito # 2 60 kV	C	L-1-1	0.69	N/A	N/A	Ignacio - Alto voltage conversion project
		Ignacio-Alto-Sausalito #2 & #1 60kV Lines	C	L-2	0.82	1.01	1.01	
NCNB-W-V-6	GUALALA 60kV	Fulton - Ignacio No.1 230 kV & Fulton - Lakeville - Igancio 230 kV	C	L-1-1	0.95	0.96	0.89	Install reactive support at Annapolis / Fort Ross in 2022
		Fulton-Lakeville & Fulton-Ignacio 230kV Lines	C	L-1-1	0.95	0.96	0.89	
NCNB-W-V-7	HARTLEY 60kV	Clear Lake- Hopland 60 Kv & KONOCTI6 - Eagle Rck 60kV	C	L-1-1	0.59	0.96	0.94	Drop load at Hartley
NCNB-W-V-8	HPLND JT 115kV	Mendocno- Ukiah 115 kV & GEYSER # 3 - CLOVERDALE 115K	C	L-1-1	0.86	0.86	0.83	Drop load at Ukiah and City of Ukiah
NCNB-W-V-9	KONOCTI6 60kV	Clear Lake- Hopland 60 Kv & KONOCTI6 - Eagle Rck 60kV	C	L-1-1	0.45	0.97	0.96	Middletown 115kV project
NCNB-W-V-10	LOWR LKE 60kV	KONOCTI6 - Eagle Rck 60kV	B	L-1	0.90	1.01	1.00	
		BUS FAULT AT EGLERCK 60kV	C	Bus	0.90	1.01	1.00	
		Clear Lake- Hopland 60 Kv & KONOCTI6 - Eagle Rck 60kV	C	L-1-1	0.43	0.99	0.99	
NCNB-W-V-11	MIDDLTWN 60kV	KONOCTI6 - Eagle Rck 60kV	B	L-1	0.88	1.04	1.03	
		BUS FAULT AT EGLERCK 115kV	C	Bus	0.89	1.04	1.04	
		BUS FAULT AT EGLERCK 60kV	C	Bus	0.88	1.04	1.03	
		Clear Lake- Hopland 60 Kv & KONOCTI6 - Eagle Rck 60kV	C	L-1-1	0.39	1.04	1.04	

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Winter Peak**

**High/Low Voltage**

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	
NCNB-W-V-12	OLEMA 60kV	IGNACO A 115/60.00 kV BANK & IGNACO B 115/60.00 kV BANK	C	T-1-1	1.01	0.87	0.87	Close the NO tie line between Lakeville Jct - Novato Jct 60kV. Drop load at Novato / Stafford sub as needed.
NCNB-W-V-13	SAUSALTO 60kV	Ignacio _Alto 60 kV & Ignacio - Alto - Saulsalito # 2 60 kV	C	L-1-1	0.68	N/A	N/A	
NCNB-W-V-14	STAFFORD 60kV	IGNACO A 115/60.00 kV BANK & IGNACO B 115/60.00 kV BANK	C	T-1-1	1.02	0.88	0.88	Close the NO tie line between Lakeville Jct - Novato Jct 60kV. Drop load at Novato / Stafford sub as needed.
NCNB-W-V-15	TOTALOMA 60kV		C	T-1-1	1.02	0.88	0.87	
NCNB-W-V-16	UKIAH 115kV	Mendocno- Ukiah 115 kV & GEYSER # 3 - CLOVERDALE 115K	C	L-1-1	0.84	0.83	0.81	Drop load at Ukiah and City of Ukiah
NCNB-W-V-17	UPPR LKE 60kV	Clear Lake- Hopland 60 Kv & KONOCTI6 - Eagle Rck 60kV	C	L-1-1	0.67	0.97	0.96	Drop load at Upper lake / Hartley
NCNB-W-V-18	WOODACRE 60kV	IGNACO A 115/60.00 kV BANK & IGNACO B 115/60.00 kV BANK	C	T-1-1	1.03	0.89	0.89	Close the NO tie line between Lakeville Jct - Novato Jct 60kV. Drop load at Novato / Stafford sub as needed.
NCNB-W-V-19	GUALALA	Common Corridor between Eagle Rock - Fulton	D	Loss of all lines in a ROW	0.96	0.93	0.89	Under review
NCNB-W-V-20	GUALALA	Common corridor south of Lakeville	D	Loss of all lines in a ROW	0.95	0.94	0.90	Under review
NCNB-W-V-21	FULTON		D	Loss of Station	0.90	0.90	0.87	Under review
NCNB-W-V-22	MONROE1		D	Loss of Station	0.91	0.90	0.87	Under review
NCNB-W-V-23	MONROE2		D	Loss of Station	0.91	0.90	0.87	Under review

**High/Low Voltage**

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	
NCNB-W-V-24	SNTA RSA	Loss of Fulton 230kV station + Xfmrs	D	Loss of Station	0.91	0.91	0.88	Under review
NCNB-W-V-25	RINCON		D	Loss of Station	0.92	0.92	0.89	Under review
NCNB-W-V-26	GUALALA		D	Loss of Station	0.86	0.84	0.76	Under review
NCNB-W-V-27	ANNAPOLS		D	Loss of Station	0.88	0.87	0.80	Under review
NCNB-W-V-28	FORT RSS		D	Loss of Station	0.90	0.88	0.82	Under review
NCNB-W-V-29	SLMN CRK		D	Loss of Station	0.90	0.89	0.83	Under review
NCNB-W-V-30	MONTE RO		D	Loss of Station	0.92	0.90	0.85	Under review
NCNB-W-V-31	MOLINO		D	Loss of Station	0.92	0.92	0.88	Under review
NCNB-W-V-32	GYSRVILLE		D	Loss of Station	0.92	0.91	0.87	Under review
NCNB-W-V-33	GYSR 1-2		D	Loss of Station	0.92	0.91	0.87	Under review
NCNB-W-V-34	FTCH MTN		D	Loss of Station	0.92	0.91	0.87	Under review
NCNB-W-V-35	COTATI		D	Loss of Station	0.91	0.90	0.86	Under review
NCNB-W-V-36	SNMALDFL		D	Loss of Station	0.91	0.90	0.86	Under review
NCNB-W-V-37	SILVERDO		D	Loss of Station	0.92	0.92	0.89	Under review
NCNB-W-V-38	MONTCLLO		D	Loss of Station	0.92	0.92	0.89	Under review
NCNB-W-V-39	MNTCLOPH		D	Loss of Station	0.92	0.92	0.90	Under review
NCNB-W-V-40	LAGUNA		D	Loss of Station	0.91	0.91	0.87	Under review



## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Summer Light Load & Summer Off-Peak**


## High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-V-1	ANNAPOLS 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	Diverged	N/A	Close the tie line between Petaluma C jct and Cotati sub (under off-peak conditions). Drop load at Cotati if overloads exist.
NCNB-OP-V-2	BIG RIVR 60kV	Mendocno- Ukiah 115 kV & Mendocino-Willits- Fort Bragg 60 kV	C	L-1-1	1.30	1.05	N/A	Big river SVC. Adjust generation in the interim
NCNB-OP-V-3	CALISTGA 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	Diverged	N/A	Close the tie line between Petaluma C jct and Cotati sub (under off-peak conditions). Drop load at Cotati if overloads exist.
NCNB-OP-V-4	CLVRDLJT 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-5	COTATI 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-6	ELK 60kV	Mendocno- Ukiah 115 kV & Mendocino-Willits- Fort Bragg 60 kV	C	L-1-1	1.23	1.05	N/A	Big river SVC. Adjust generation in the interim
NCNB-OP-V-7	FCHMNT2 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	Diverged	N/A	Close the tie line between Petaluma C jct and Cotati sub (under off-peak conditions). Drop load at Cotati if overloads exist.
NCNB-OP-V-8	FORT RSS 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-9	FRT BRGG 60kV	Mendocno- Ukiah 115 kV & Mendocino-Willits- Fort Bragg 60 kV	C	L-1-1	1.30	1.06	N/A	Big river SVC. Adjust generation in the interim
		Ukiah-Hopland-Cloverdale 115 kV & Cortina - Mendocino No.1 115 kV	C	L-1-1	0.99	1.11	N/A	
NCNB-OP-V-10	FTCH MTN 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	Diverged	N/A	Close the tie line between Petaluma C jct and Cotati sub (under off-peak conditions). Drop load at Cotati if overloads exist.
NCNB-OP-V-11	FTCHMTNP 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-12	FULTON 60kV		C	T-1-1	Diverged	Diverged	N/A	

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Summer Light Load & Summer Off-Peak**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-V-13	GARCIA 60kV	Mendocno- Ukiah 115 kV & Mendocino- Willits- Fort Bragg 60 kV	C	L-1-1	1.23	1.05	N/A	Big river SVC. Adjust generation in the interim
		Ukiah-Hopland-Cloverdale 115 kV & Cortina - Mendocino No.1 115 kV	C	L-1-1	1.00	1.11	N/A	
NCNB-OP-V-15	GUALALA 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	T-1-1	Diverged	Diverged	N/A	Close the tie line between Petaluma C jct and Cotati sub (under off-peak conditions). Drop load at Cotati if overloads exist.
NCNB-OP-V-16	GYSR 1-2 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-17	GYSRJCT1 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-18	GYSRJCT2 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-19	GYSRVLLE 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-20	HDSBGTP1 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-21	HDSBGTP2 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-22	LAGUNA 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-23	LAGUNATP 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-24	MIRABEL 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-25	MIRBELTP 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-26	MLNO JCT 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-27	MOLINO 60kV		C	T-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-28	MONTE RO 60kV		C	T-1-1	Diverged	Diverged	N/A	

# 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Summer Light Load & Summer Off-Peak**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
NCNB-OP-V-29	PHILO 60kV	Mendocno- Ukiah 115 kV & Mendocino- Willits- Fort Bragg 60 kV	C	L-1-1	1.16	1.04	N/A	Big River SVC. Adjust Generation to mitigate the high voltage
NCNB-OP-V-30	PNT ARNA 60kV	Mendocno- Ukiah 115 kV & Mendocino- Willits- Fort Bragg 60 kV	C	L-1-1	1.23	1.05	N/A	
		Ukiah-Hopland-Cloverdale 115 kV & Cortina - Mendocino No.1 115 kV	C	L-1-1	1.00	1.11	N/A	
NCNB-OP-V-31	SLMN CRK 60kV	FULTON 115/60.00 KV BANK NO.1 & FULTON 115/60.00 KV BANK NO.2	C	L-1-1	Diverged	Diverged	N/A	Add a new Fulton 115 / 60kV transformer. In the interim drop load at Molino, Mirabel, Heldsberg, Gyserville & Fitch mountain
NCNB-OP-V-32	SLMN JCT 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-33	SNMA TAP 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-34	SNMALDFL 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-35	ST.HELNA 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-36	TRNTN JT 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-37	TRNTN_JC 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-38	WHLR JCT 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-39	WHLR TAP 60kV		C	L-1-1	Diverged	Diverged	N/A	
NCNB-OP-V-40	WOHLER 60kV		C	L-1-1	Diverged	Diverged	N/A	

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and Bay - Summer Peak**

### Single Contingency Load Drop



ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

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

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Winter Peak**



### Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	

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

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Summer Light Load & Summer Off-Peak**



### Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Summer Off-Peak	N/A	

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

## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and Bay - Summer Peak**

**Single Source Substation with more than 100 MW Load**



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single source substation with more than 100 MW Load



## 2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E North Coast and North Bay- Winter Peak**

**Single Source Substation with more than 100 MW Load**



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Winter Peak	2017 Winter Peak	2022 Winter Peak	

No single source substation with more than 100 MW Load

Study Area: **PG&E North Coast and North Bay- Summer Light Load & Summer Off-Peak**



*Single Source Substation with more than 100 MW Load*

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No single source substation with more than 100 MW Load