



2023 & 2027 Final LCR Study Results Sierra Area

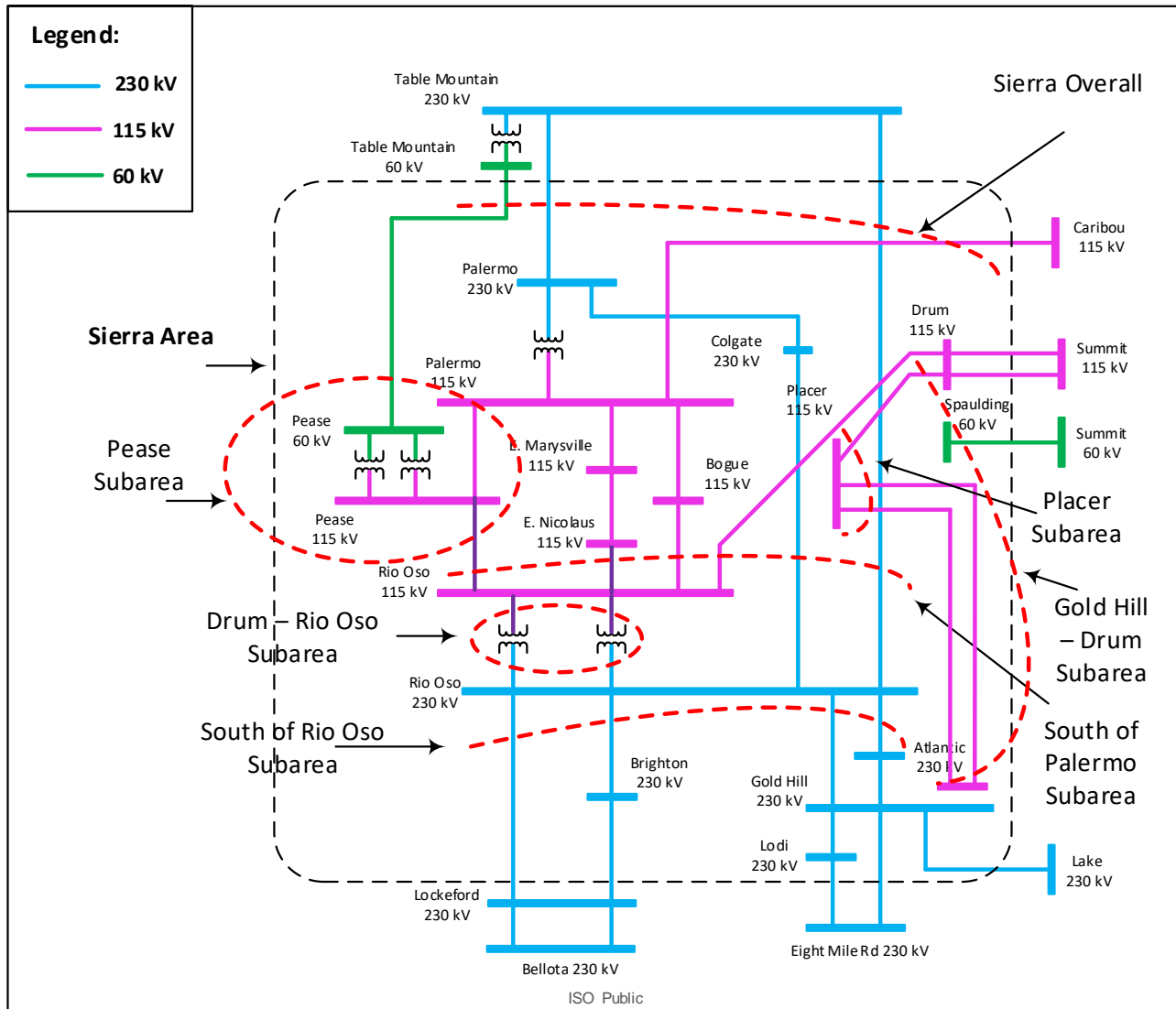
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Stakeholder Call

April 12, 2022

Sierra Area Transmission System & LCR Sub-areas



New major transmission projects

Project Name	Expected ISD
Year 2023	
South of Palermo 115 kV Reinforcement Project	In Operation
Year 2027	
Rio Oso 230/115 kV Transformer Upgrades	Oct-23
Rio Oso Area 230 kV Voltage Support	Jul-24

Power plant changes

Additions:

- No new resource addition

Retirements:

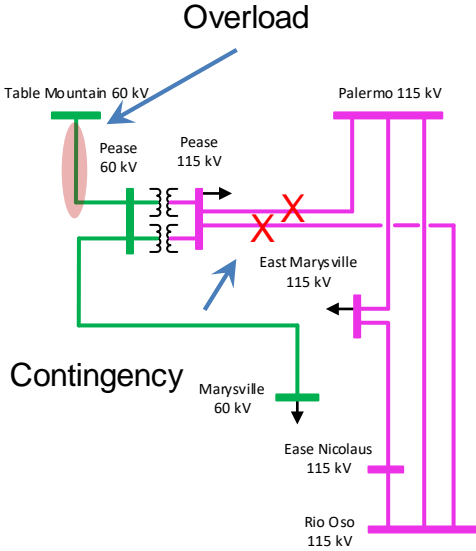
- No new retirements

Sierra Area Overall: Load and Resources

Load (MW)	2023	2027	Generation (MW)	2023	2027
Gross Load	1,761	1,848	Market/ Net Seller/ Battery	698	698
AAEE	-14	-21	Muni	1,156	1,156
Behind the meter DG	-8	0	QF	50	50
Net Load	1,740	1,827	Solar	5	5
Transmission Losses	72	74	Existing 20-minutes Demand Response	0	0
Pumps	0	0	Mothballed	0	0
Load + Losses + Pumps	1,812	1,901	Total Qualifying Capacity	1,909	1,909

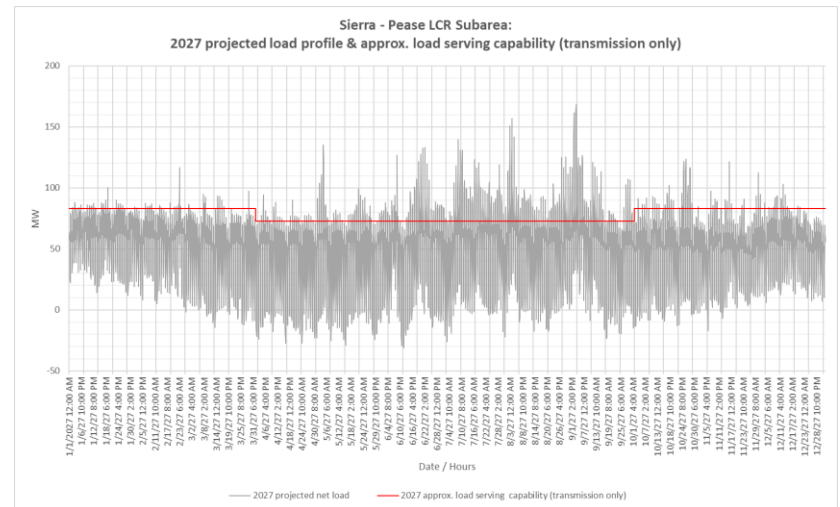
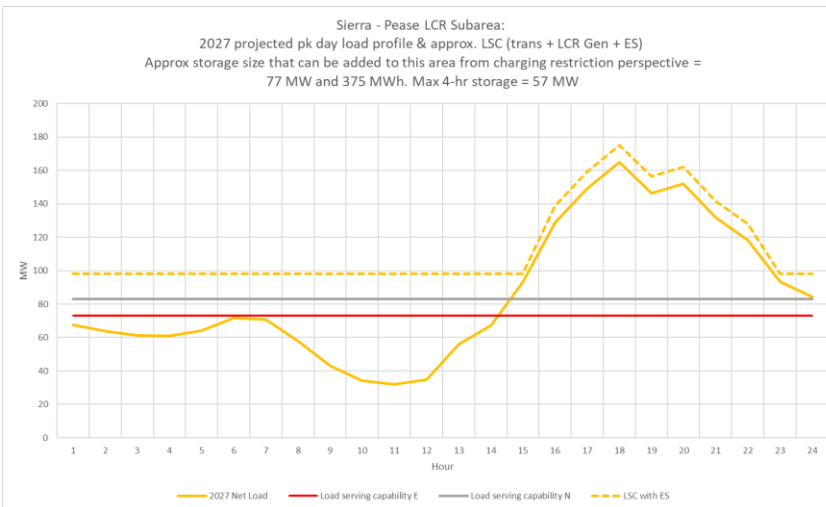
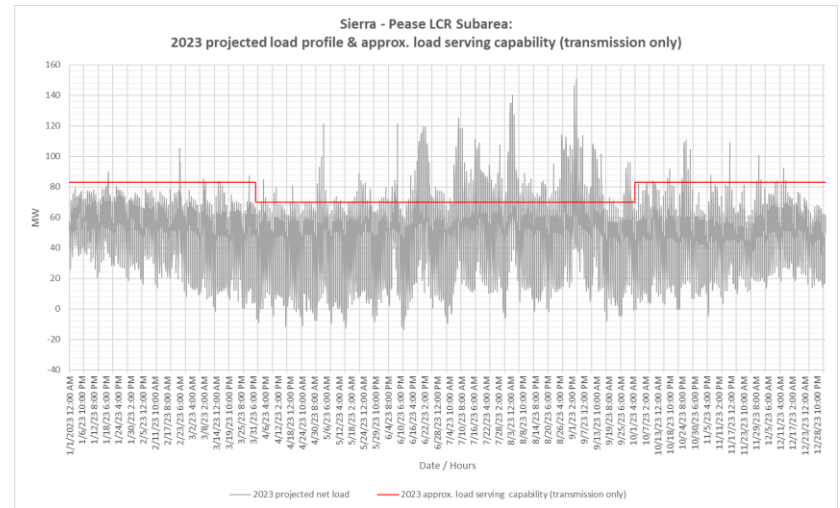
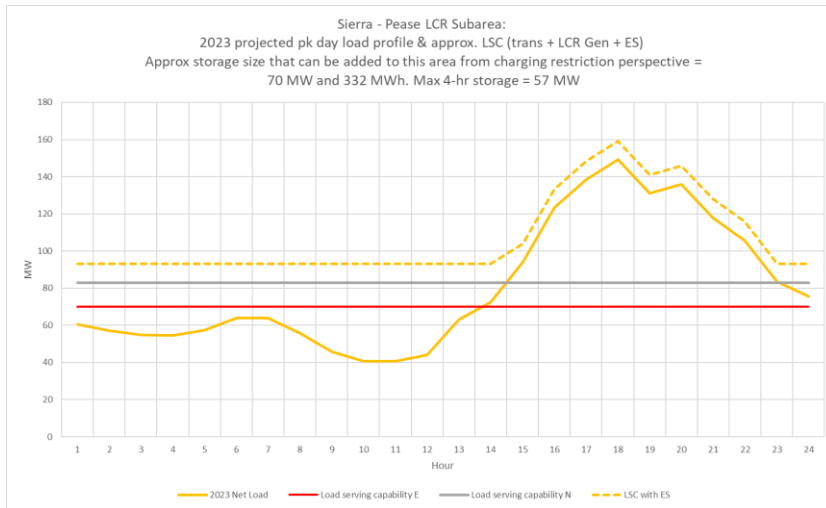
Pease Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	P6, P7	Table Mountain – Pease 60 kV line	Palermo – Pease 115 kV and Pease – Rio Oso 115 kV	80
2027	P6, P7	Table Mountain – Pease 60 kV line	Palermo – Pease 115 kV and Pease – Rio Oso 115 kV	92

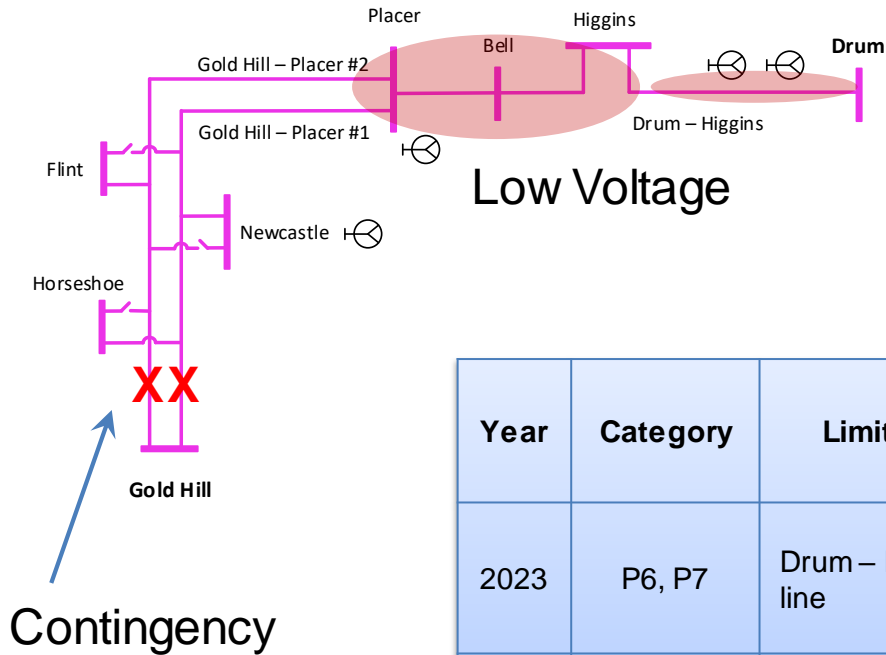


ISO Public

Pease Sub-area: Load Profiles

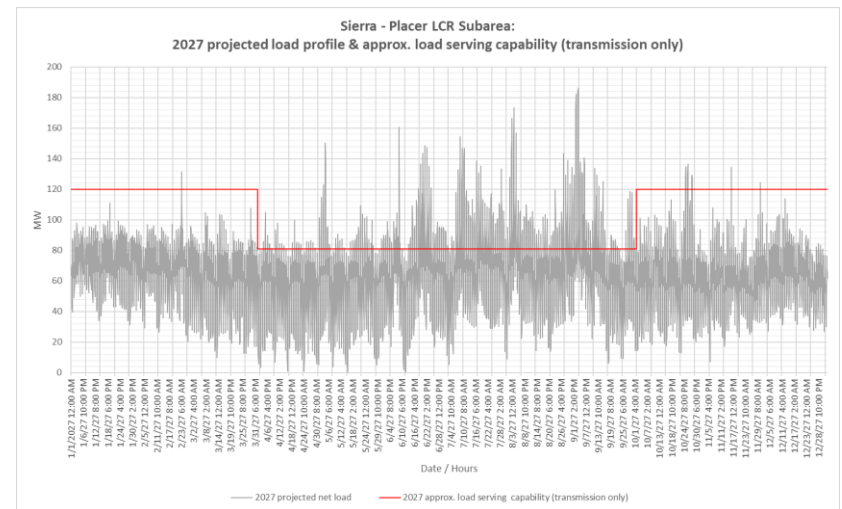
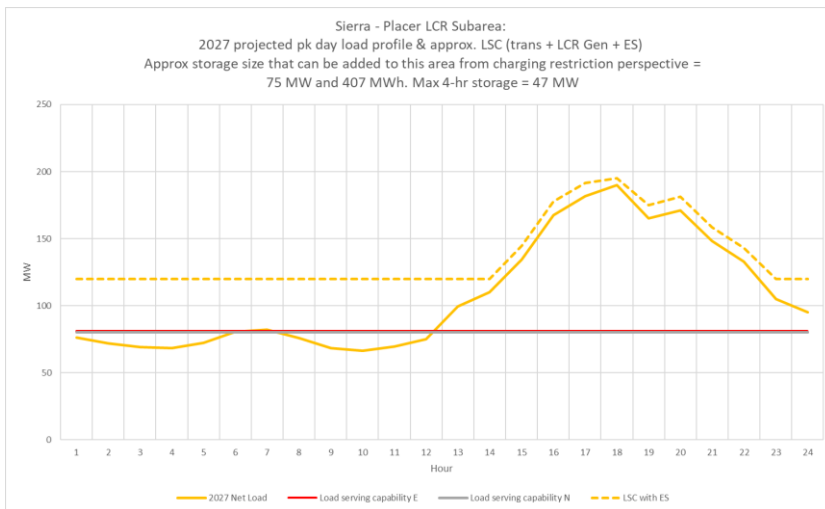
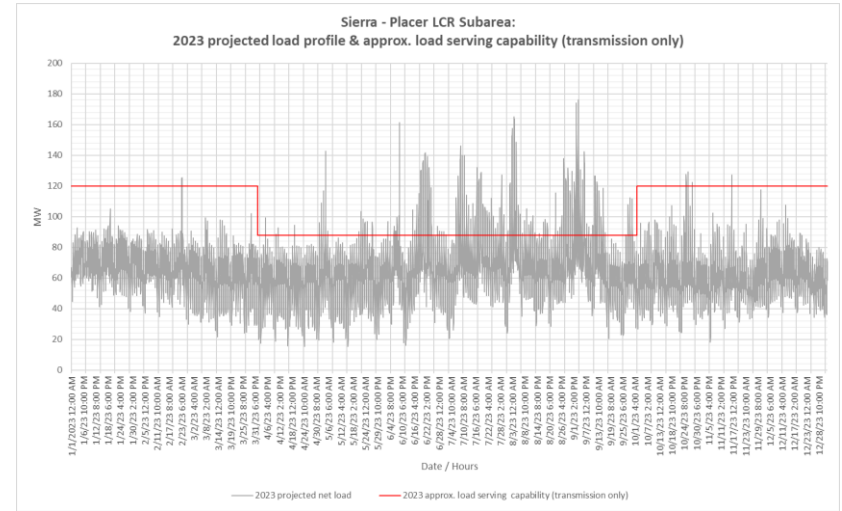
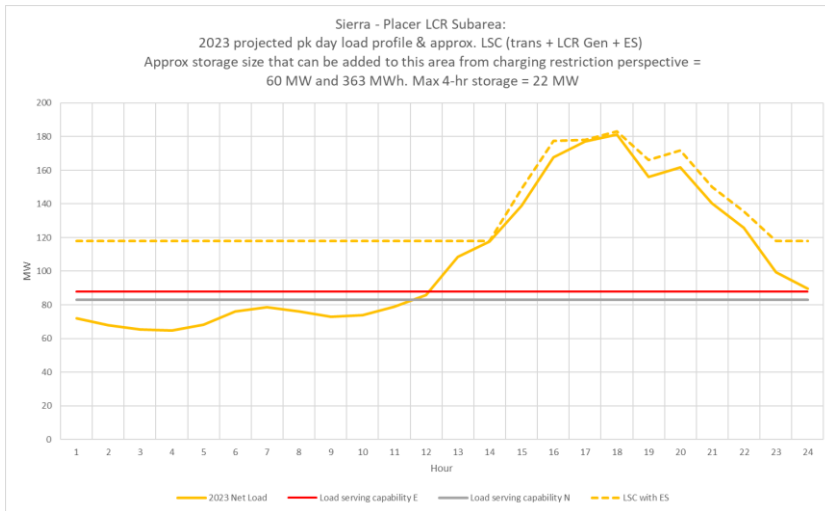


Placer Sub-Area: Requirements



Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	P6, P7	Drum – Higgins 115 kV line	Gold Hill – Placer #1 and #2 115 kV lines	95 (32)
2027	P6, P7	Low voltage at Placer, Bell, and Higgins 115 kV buses	Gold Hill – Placer #1 and #2 115 kV lines	115 (52)

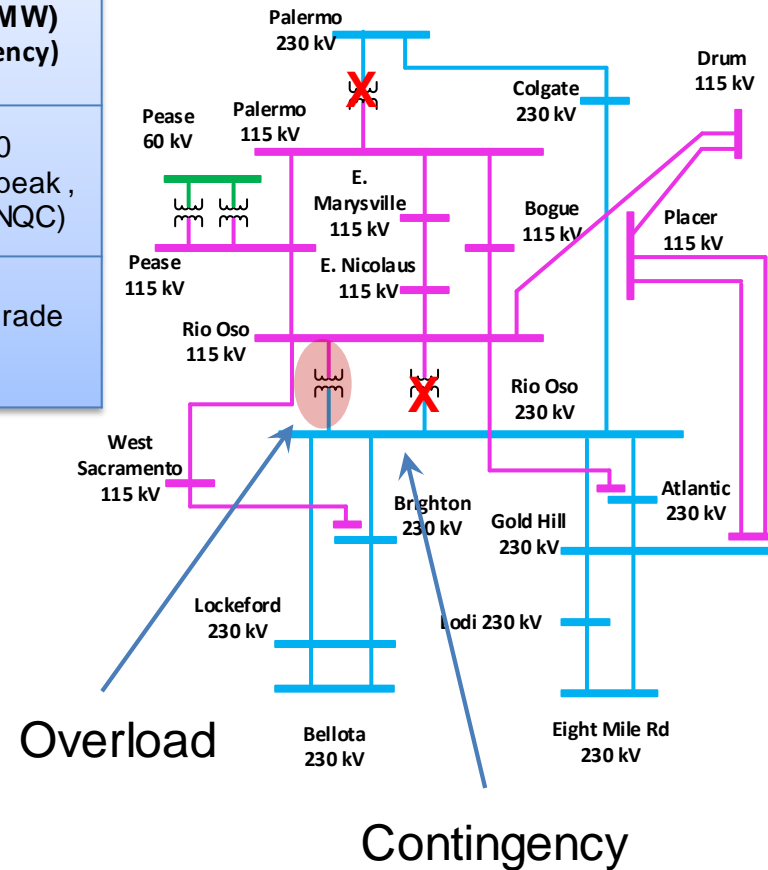
Placer Sub-area: Load Profiles



Drum – Rio Oso Sub-Area: Requirements

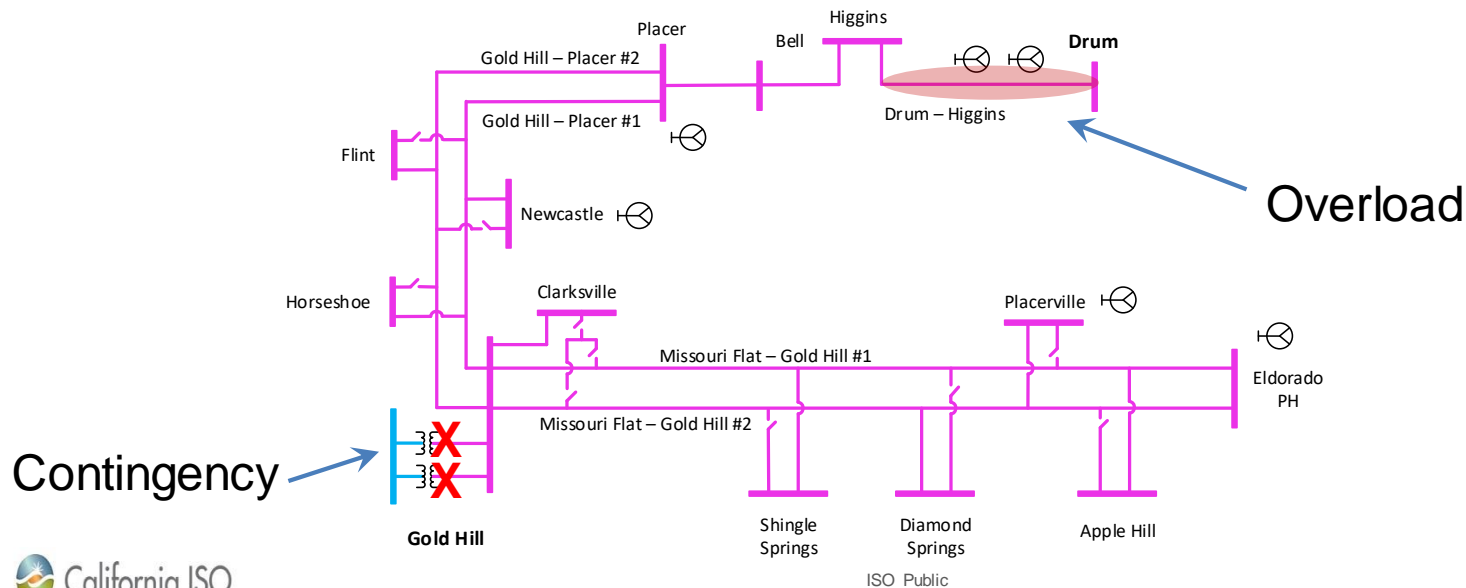
Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	P6	Rio Oso 230/115 kV #1 Transformer	Rio Oso 230/115 kV #2 and Palermo 230/115 kV #2 Transformers	750 (197 at peak , 192 at NQC)
2027	n/a	No requirement due to Rio Oso 230/115 kV Transformer Upgrade project		

- While the deficiency values in the table are based on P6 contingencies, the sub-area is deficient for P1 contingency of Palermo 230/115 kV TB #2

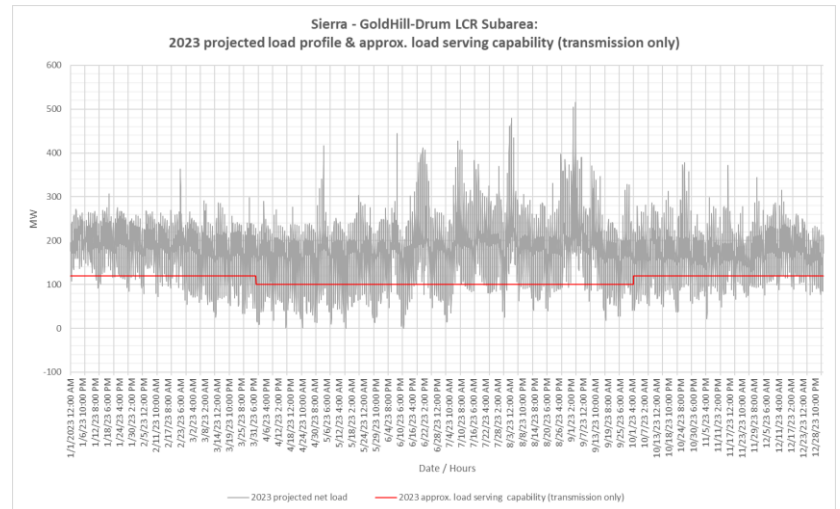
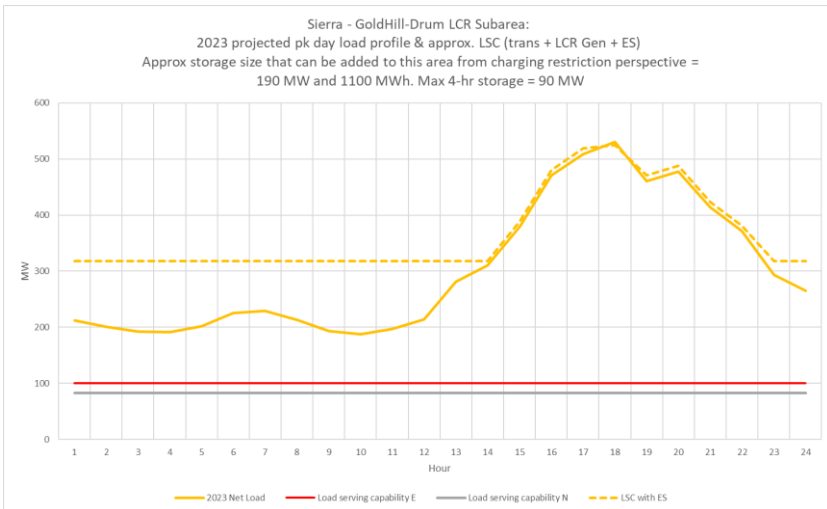
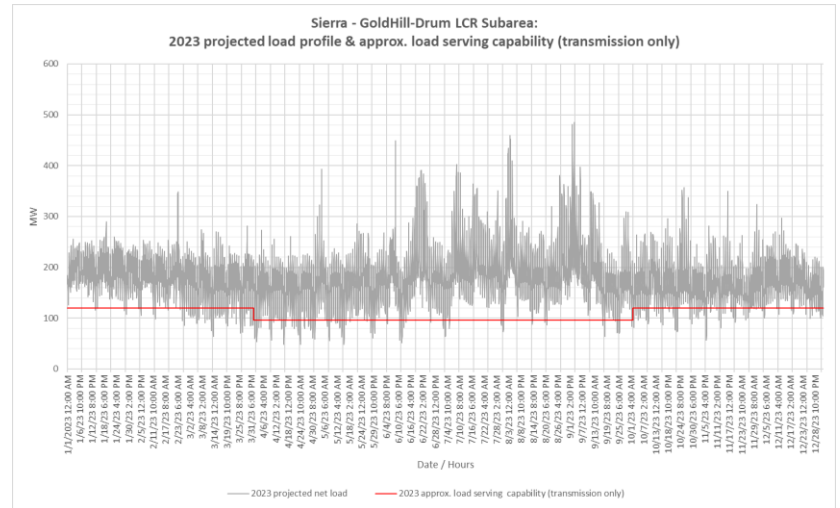
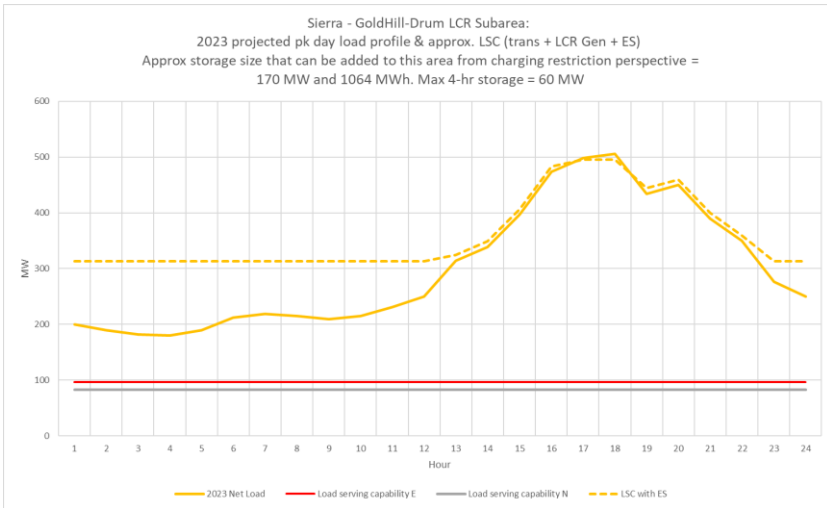


Gold Hill - Drum Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	P6	Drum – Higgins 115 kV	Gold Hill 230/115 kV #1 and Gold Hill 230/115 kV #2 Transformers	400 (327)
2027	P6	Drum – Higgins 115 kV	Gold Hill 230/115 kV #1 and Gold Hill 230/115 kV #2 Transformers	425 (352)

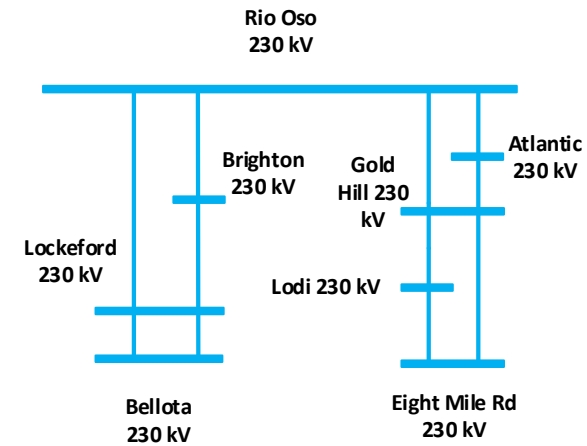


Gold Hill - Drum Sub-area: Load Profiles



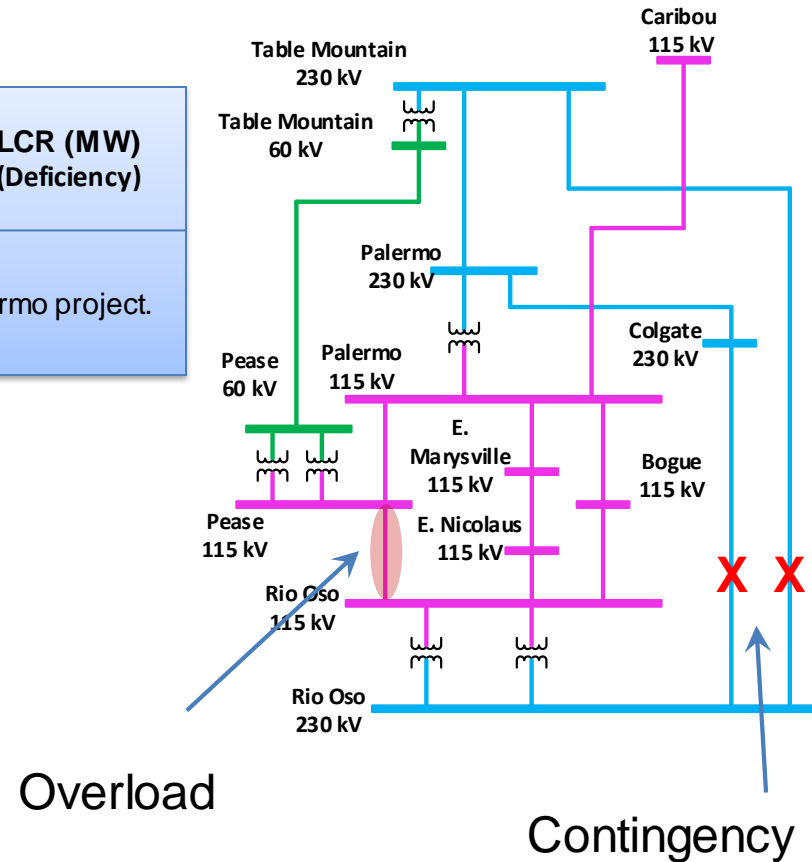
South of Rio Oso Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	P6	Rio Oso – Atlantic 230 kV	Rio Oso – Gold Hill 230 kV Rio Oso – Brighton 230 kV	306
2027	P6	Rio Oso – Atlantic 230 kV	Rio Oso – Gold Hill 230 kV Rio Oso – Brighton 230 kV	353



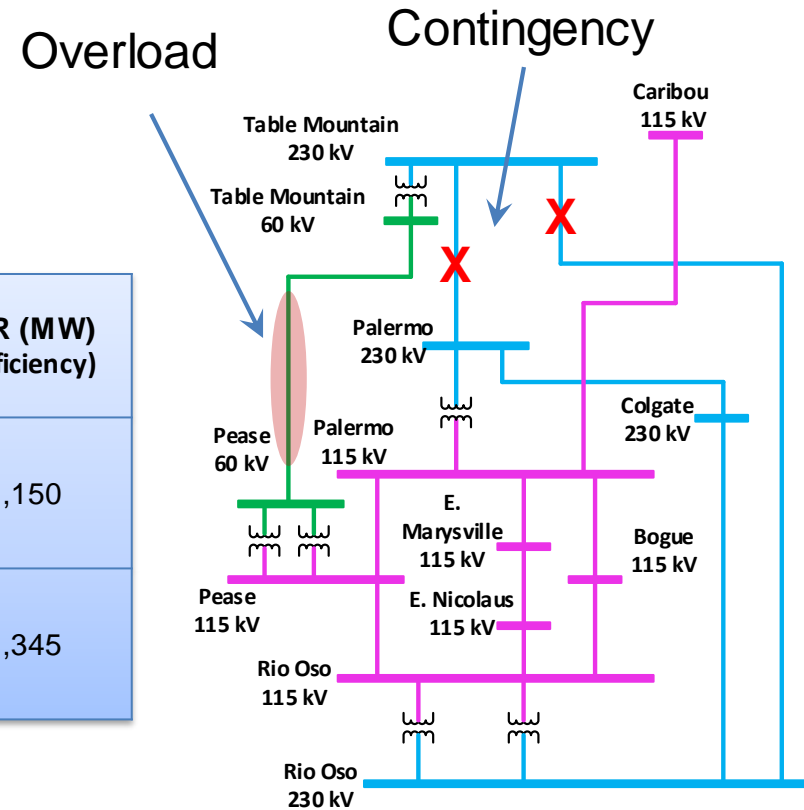
South of Palermo Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	All	No requirements due to implementation of South of Palermo project.		
2027				



South of Table Mountain Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2023	P6, P7	Table Mountain – Pease 60 kV	DCTL of Table Mtn. – Palermo and Table Mtn. Rio Oso 230 kV lines	1,150
2027	P6, P7	Table Mountain – Pease 60 kV	DCTL of Table Mtn. – Palermo and Table Mtn. Rio Oso 230 kV lines	1,345



Changes from 2022 to 2023

Sub-area	2022		2023	
	Load	LCR	Load	LCR
Pease	134	60	148	80
Placer	159	80	181	95
Drum - Rio Oso	N/A	748	N/A	750
Gold Hill - Drum	444	366	506	400
South of Rio Oso	N/A	256	N/A	306
South of Table Mountain	N/A	1,220	N/A	1,150
Total	1,619	1,503	1,812	1,495

The overall LCR requirement in 2023 is similar to 2022. The slight decrease is due to change in resources NQC values. In certain sub-areas the LCR requirement went up due to the increase in the load forecast.

N/A=Flow-through area. No defined load pocket.

Changes from 2026 to 2027

Sub-area	2026		2027	
	Load	LCR	Load	LCR
Pease	154	80	163	92
Placer	194	127	191	115
Gold Hill - Drum	526	450	528	425
South of Rio Oso	N/A	308	N/A	353
South of Table Mountain	N/A	1,690	N/A	1,345
Total	1,880	2,021	1,901	1,707

The load forecast for the overall area is similar between year 2027 and 2026 however the overall LCR requirement in 2027 decreased compared to 2026 due to change in resources NQC values.

N/A=Flow-through area. No defined load pocket.

Sierra Area Total LCR Need

Study Year	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
2023	1,150	354	1,495
2027	1,345	352	1,707