

# Proposed SCE Reliability Transmission Projects for the 2024-2025 Transmission Planning Process

2024-2025 Transmission Planning Process Stakeholder Meeting  
September 23-24, 2024

# Proposed Reliability Projects for the 2024-2025 TPP

SCE conducts its Annual Transmission Reliability Assessment (ATRA) in coordination with the CAISO. Based on the results, SCE is submitting the 16 reliability projects listed below into the 2024-2025 TPP request window. All costs are in 2024 dollars and estimated according to the SCE 2024 Draft Per Unit Cost Guide.

#	Project	Estimated Cost	Proposed In-Service Date
1	Coolwater to Ivanpah 115 kV Line Rebuild	\$485	06/30/2034
2	Coolwater Second A-Bank and Lines Relocation	\$66	06/30/2031
3	Control 115/55 kV B-Banks Replacement	\$38	12/31/2032
4	Kramer-Coolwater 115 kV line Looping into Tortilla 115 kV Substation	\$37	06/30/2034
5	New Kramer 230/115 kV A Bank (Third A-Bank)	\$28	12/31/2034
6	Tortilla 115 kV Capacitor Replacement	\$5	06/30/2029
7	Pardee-Vincent No. 2 230 kV Line Upgrade	\$68	12/31/2033
8	Serrano 500 kV GIS SCD Upgrade	\$183	12/31/2029
9	Serrano 230 kV GIS Bus Split	\$28	12/31/2029
10	Alamitos 230 kV SCD Upgrade	\$5	12/31/2032
11	Santa Clara-Vincent 230 kV Advanced Reconductor	\$85	12/31/2031
12	Moorpark-Santa Clara No. 1 230 kV Advanced Reconductor	\$55	06/01/2029
13	Moorpark-Santa Clara #2 230 kV Advanced Reconductor	\$55	06/01/2029
14	Pardee-Santa Clara 230 kV Advanced Reconductor	\$71	04/01/2030
15	Julian Hinds-Mirage 230 kV Advanced Reconductor	\$76	04/01/2030
16	Magunden-Springville No. 2 230 kV Advanced Reconductor	\$96	06/01/2029

# Proposed Reliability Projects

# 1. Coolwater to Ivanpah 115 kV Line Rebuild

## Project Need and Purpose

- Need to rebuild the Coolwater to Ivanpah 115 kV line due to numerous GO95 clearance issues.
- Mitigate system instability, low voltage issues, and thermal overloads for several N-1 contingencies.
- Coolwater to Ivanpah 115 kV line underrated to support the increase in load demand at Baker Substation.
- Existing tapped substations are not built to standard and cannot accommodate increase in load.

## Proposed Scope

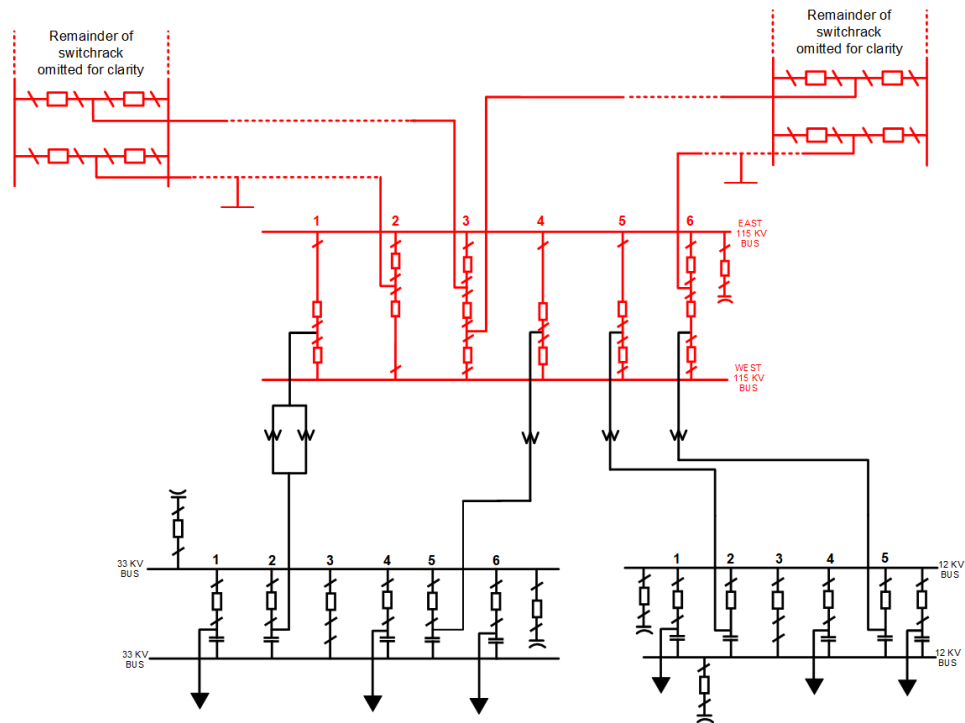
- Rebuild Coolwater to Ivanpah 115 kV Line as double circuit structure with two 115 kV circuits using 954 SAC or a High-Temperature Low Sag (HTLS) equivalent.
- Rebuild Baker 115/33/12kV tapped substations as new ISO controlled switching station.
- Loop new 115 kV lines into rebuilt Baker Substation.

## Impact of Proposed Project

- Meet GO95 requirements.
- Address the long-term transmission needs of this transmission corridor.
- Substation rebuild to serve load growth and to meet current standards.
- New 115 kV ISO Controlled Switching Station.

## Alternatives

- Double circuit structure with one side strung in lieu of both (initial cost is very similar to the proposed mitigation)
- Single circuit structure to accommodate rebuild of Coolwater to Ivanpah 115 kV Line (does not increase reliability in the area)
- SCE explored derating the line to 35 MVA as an alternative to the rebuild but identified base case thermal overloads starting in 2026.



Transmission Project	Minimum Required	Proposed Right-sized	Proposed ISD
Single circuit rebuild	\$380	N/A	06/30/2034
Double circuit rebuild	N/A	\$437	
Baker 115 kV Sub. Rebuild	\$48	\$48	
<b>TOTAL</b>	<b>\$428</b>	<b>\$485</b>	

# 1. Coolwater to Ivanpah 115 kV Line Rebuild

## Power Flow Results for Peak ATRA Cases

Facility	Line Rating	2026	2029	2034	2039
<b>Ivanpah-Baker-Coolwater-Dunn Siding-Mtn Pass 115 kV line</b>	Peak Case Flow*	36.7 MVA	56.1 MVA	107.3 MVA	127.6 MVA
	35 MVA	106.3 %	161.6%	333.3%	375.7%
	83 MVA	44.8%	68.2%	140.5%	158.4%
<b>Single Circuit Rebuild</b>	Peak Case Flow*	N/A	N/A	115 MVA	135 MVA
	217 MVA	N/A	N/A	53.0%	62.2%
<b>Double Circuit, Double Loop (Sum of both Ivanpah lines)</b>	Peak Case Flow*	N/A	N/A	173 MVA	211 MVA
	217 MVA	N/A	N/A	79.7%	97.2%
	434 MVA	N/A	N/A	39.8%	48.6%

\*MVA values represent the power flowing through the 115 kV line in each case (single circuit, double circuit, etc.)

## Steady State Voltage Results for Peak ATRA Cases

Substation	Contingency (Category)	2026	2029	2034*	2039*
<b>Baker 115 kV</b>	None (P0)	0.964	0.945	0.909	0.866
<b>Baker 115 kV</b>	Most Severe N-1 (P1)	0.873	DIV	DIV	DIV
<b>Dunn Siding 115 kV</b>	None (P0)	0.987	0.921	0.872	0.939
<b>Dunn Siding 115 kV</b>	Most Severe N-1 (P1)	0.944	0.935	0.872	0.584
<b>Mt. Pass 115 kV</b>	None (P0)	0.992	0.996	0.996	0.973
<b>Mt. Pass 115 kV</b>	Most Severe N-1 (P1)	DIV	DIV	DIV	DIV

\*Fictitious capacitors placed on various buses within the case to allow the case to be solved. Additional capacitors may cause inconsistent voltage readings on buses.

# 1. Coolwater to Ivanpah 115 kV Line Rebuild

## Summary of Alternatives

Alternatives	Risks
<b>Double Circuit Tower with Box Configuration</b>	<ul style="list-style-type: none"> <li>• Cost is very similar to the suggested mitigation with limited savings.</li> <li>• While the single circuit rebuild addresses GO95 infractions and load growth in the near term, it does not resolve issues in the long-term planning horizon.</li> </ul>
<b>Double Circuit Tower with one side strung</b>	<ul style="list-style-type: none"> <li>• If the second circuit is constructed afterwards, the additional cost will be considerably larger compared to it being included now.</li> <li>• Increased environmental impacts as SCE would have to disturb the land twice.</li> <li>• Cost is very similar to the suggested mitigation with limited savings.</li> <li>• While the single circuit rebuild addresses GO95 infractions and load growth in the near term, it does not resolve issues in the long-term planning horizon.</li> </ul>
<b>Single Circuit Rebuild</b>	<ul style="list-style-type: none"> <li>• Thermal Overloads will be solved for the foreseeable future; however, low voltage will still be an issue.</li> <li>• Maximum cost savings compared to the suggested mitigation; however, limited increase in operability.</li> <li>• While the single circuit rebuild addresses GO95 infractions and load growth in the near term, it does not resolve issues in the long-term planning horizon.</li> </ul>

## 2. Coolwater Second A-Bank and Lines Relocation

### Project Need and Purpose

- Mitigate system instability and low voltage issues for the N-1 of the Coolwater 1 A-Bank.

### Proposed Scope

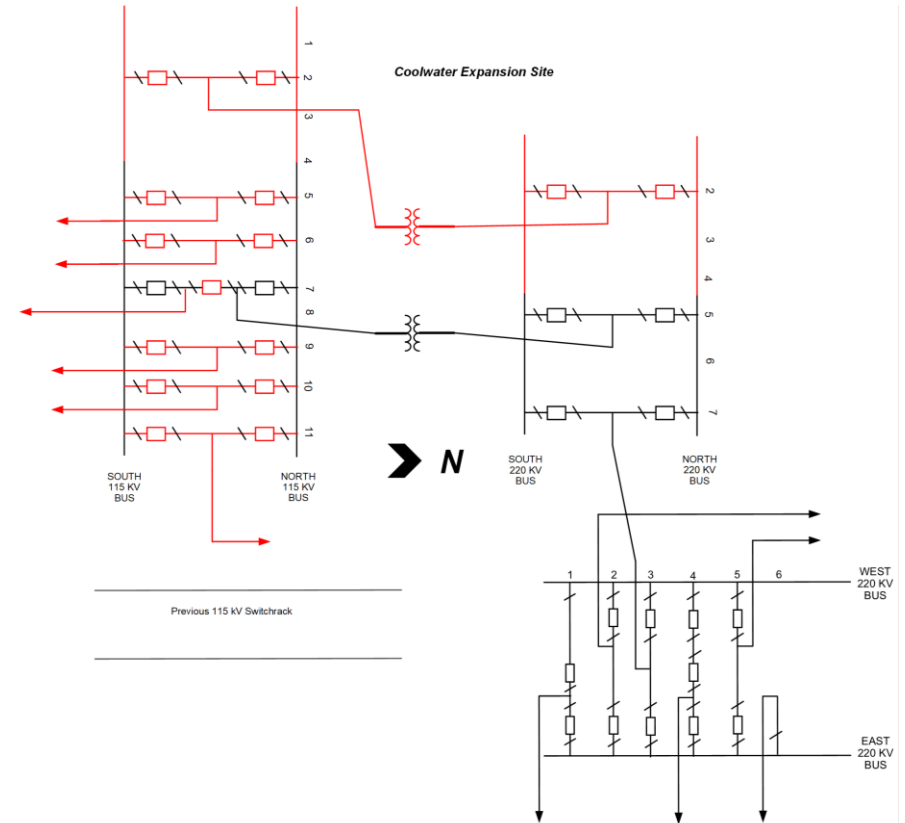
- Relocate the existing 115 kV lines to the proposed Coolwater Expansion Site.
- Extend 220 kV and 115 kV proposed switchrack.
- Relocate six (6) 115 kV lines.
- Add 2nd 220/115 kV A-Bank.
- Add CRAS monitoring.

### Impact of Proposed Project

- Increase the ability in capacity to serve existing and planned load.

### Alternatives

- Include 230 kV Relocation with 115 kV relocation (+25 M).



Main System	Estimated Cost	Proposed ISD
North of Lugo	\$66 M	06/30/2031

## 2. Coolwater Second A-Bank and Lines Relocation

### Power Flow Results for Peak ATRA Cases

Overloaded Facility	Line Rating	2026*	2029	2034	2039
N/A	Coolwater 1A Bank	N/A	DIV	DIV	DIV

\*Transformer banks do not exist in the 2026 case.

### Summary of Alternatives

Alternatives	Risks
<b>Existing Project and Relocation of 220 kV Switchrack.</b>	<ul style="list-style-type: none"> <li>• An additional \$25 million to the project cost.</li> <li>• No limiting components from a power flow perspective.</li> </ul>
<b>Maintain the two existing 115 kV and 220 kV sites and rebuild the 115 kV switchrack</b>	<ul style="list-style-type: none"> <li>• Significant Outage Schedule.</li> <li>• Limiting the expandability of the 115 kV switchrack.</li> </ul>



# 3. Control 115/55 kV B-Banks Replacement

## Project Need and Purpose

- Address thermal overload issues on the remaining Control 115/55 kV B-Bank due to the loss of one Control B-Bank.

## Proposed Scope

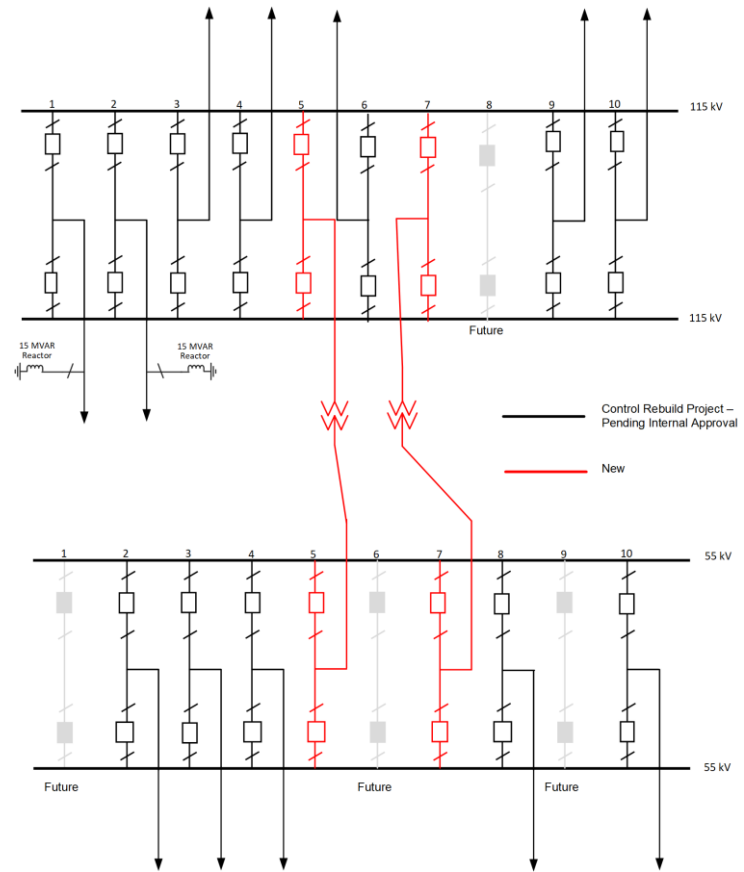
- Coordinate with Sub IR project to rebuild Control 115/55 kV.
- Replace two (2) existing 28 MVA transformers with 56 MVA transformers.

## Impact of Proposed Project

- Remediate thermal overload caused by the loss of one Control B-Bank.

## Alternatives

- Install a new Control 115/55 kV 28 MVA transformer (3rd B-Bank).
- Battery energy storage for grid support. Further analysis required.



Main System	Estimated Cost	Proposed ISD
North of Lugo	\$38 M	12/31/2032

### 3. Control 115/55 kV B-Banks Replacement

#### Power Flow Results for Peak ATRA Cases

Overloaded Facility	Line Rating	2026	2029	2034	2039
<b>Remaining Control 115/55 kV Transformer B-Bank</b>	Control 115/55 kV No.1 or No.3 Transformer B-Bank	155.4%	156.1%	154.2%	154.2%

#### Summary of Alternatives

Alternatives	Risks
<b>Add a third Control 28 MVA B-Bank</b>	<ul style="list-style-type: none"> <li>• Lower total capacity of 84 MW versus the 112 MVA for the proposed mitigation.</li> <li>• Potential for increased short-circuit duty (SCD) due to the paralleling of the three banks.</li> <li>• Capital investment is comparable in cost.</li> <li>• Could limit future expansion potential when considering the ultimate buildout.</li> </ul>
<b>Battery energy storage system (BESS) dispatched to match peak load demands</b>	<ul style="list-style-type: none"> <li>• BESS charging could hinder the ability to serve future load requests in this area.</li> <li>• Charging the BESS during off-peak hours could reduce the cooling cycle effectiveness of other infrastructure equipment, such as transformers</li> <li>• Considerably higher costs.</li> </ul>

# 4. Kramer-Coolwater 115 kV line Looping into Tortilla 115 kV Substation

## Project Need and Purpose

- Mitigate low voltage issues and thermal overloads during normal system conditions and additional low voltage issues and system voltage collapse resulting from various N-1 contingencies.

## Proposed Scope

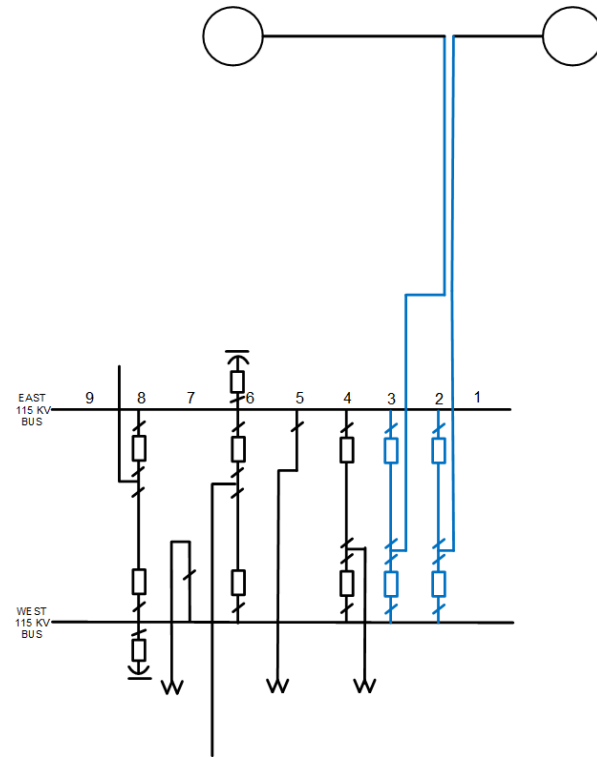
- Build ~11.5 miles of double circuit 115 kV lines and terminate both lines at Tortilla 115 kV substation.

## Impact of Proposed Project

- Fixing low voltage issues and helping to address base case thermal overload issues.

## Alternatives

- Construct a new 115 kV transmission line from Coolwater to Tortilla (~11.5 miles Double Circuit)



Main System	Estimate Cost	Proposed ISD
North of Lugo	\$37 M	06/30/2034

## 4. Kramer-Coolwater 115 kV line Looping into Tortilla 115 kV Substation

### Power Flow Results for Peak ATRA Cases

Overloaded Facility	Contingency (Category)	2026	2029	2034	2039
Coolwater-SEGS-Tortilla 115 kV line	N/A	27.6%	104.1 %	130.2%	125.3%
Coolwater-SEGS-Tortilla 115 kV line	Kramer-Accelerate 115 kV line (P1)	30.9%	124.8%	DIV	DIV
Coolwater-SEGS-Tortilla 115 kV line	Accelerate-Tortilla 115 kV line (P1)	30.9%	94.4%	DIV	DIV
Kramer-Accelerate 115 kV	Coolwater-SEGS-Tortilla 115 kV line (P1)	31.6%	DIV	DIV	DIV

### Steady State Voltage Results for Peak ATRA Cases

Substation	Contingency (Category)	2026	2029	2034*	2039*
Accelerate 115 kV	None (P0)	N/A	0.928	0.948	DIV
Accelerate 115 kV	Kramer-Accelerate 115 kV or Accelerate-Tortilla 115 kV lines (P1)	N/A	0.819	DIV	DIV
Tortilla 115 kV	None (P0)	>0.95	0.925	0.944	DIV
Tortilla 115 kV	Kramer-Accelerate 115 kV or Accelerate-Tortilla 115 kV lines (P1)	>0.95	0.821	DIV	DIV
Coolwater 115 kV	Kramer-Accelerate 115 kV or Accelerate-Tortilla 115 kV lines (P1)	>0.95	0.942	DIV	DIV

\*Fictitious capacitors placed on various buses within the case to allow the case to be solved. Additional capacitors may cause inconsistent voltage readings on buses.

## 4. Kramer-Coolwater 115 kV line Looping into Tortilla 115 kV Substation

### Summary of Alternatives

Alternatives	Risks
<b>Construct a new 11.4-miles 115 kV circuit from Coolwater to Tortilla (Double circuit Tower with existing Coolwater-SEGS-Tortilla 115 kV line)</b>	<ul style="list-style-type: none"><li>• Tortilla will only be supported by three lines rather than four lines.</li><li>• Additional work is needed at the Coolwater Substation to accommodate the new line position.</li><li>• Long line outages for the Coolwater-SEGS-Tortilla 115 kV line while under construction.</li></ul>
<b>Battery energy storage system (BESS) dispatched to match peak load demands</b>	<ul style="list-style-type: none"><li>• BESS charging could hinder the ability to serve future load requests in this area.</li><li>• Charging the BESS during off-peak hours could reduce the cooling cycle effectiveness of other infrastructure equipment, such as transformers</li><li>• Considerably higher costs.</li></ul>

# 5. New Kramer 230/115 kV A-Bank (Third A-Bank)

## Project Need and Purpose

- Mitigate thermal overload issues on the remaining Kramer A-Bank due to loss of one Kramer A-Bank and loss of one Kramer A-Bank followed by loss of generation.

## Proposed Scope

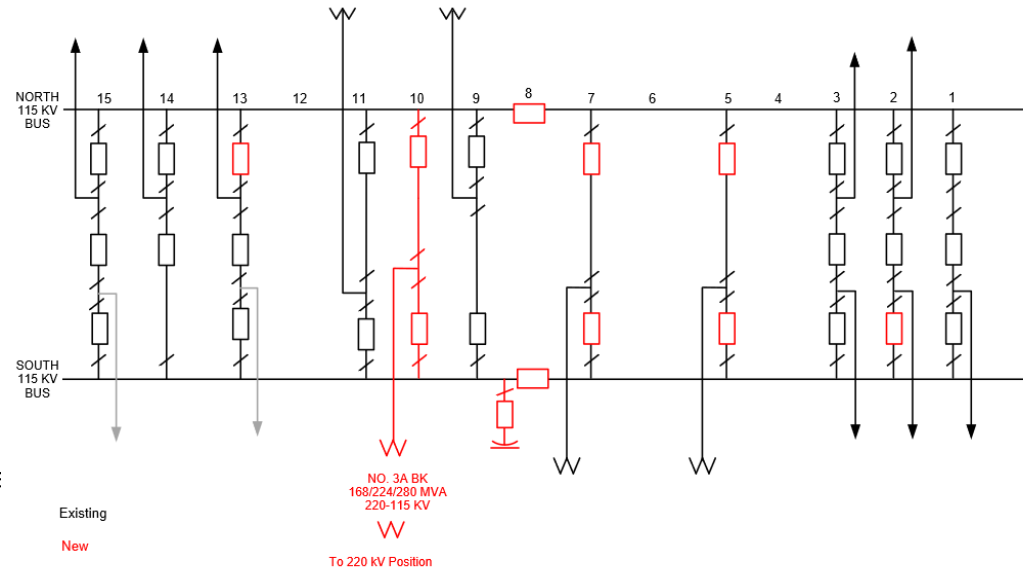
- Install 220/115kV 3rd A-bank.
- Install sectionalizing Circuit Breakers (operate closed).
- Upgrade seven (7) Circuit Breakers to 50 kA at Kramer 115 kV.

## Impact of Proposed Project

- Increase reliability, support load and generation on the 115 kV Kramer system, and reduce any potential instability for contingency scenarios.

## Alternatives

- Kramer RAS Contingency Addition.



Main System	Estimated Cost	Proposed ISD
North of Lugo	\$28M	12/31/2034

## 5. New Kramer 230/115 kV A-Bank (Third A-Bank)

### Power Flow Results for Peak ATRA Cases

Overloaded Facility	Contingency (Category)	2026	2029	2034	2039
Remaining Kramer A-Bank	Either Kramer A-Bank (P1)	71.1%	70.0%	108.9%	141.4%
Remaining Kramer A-Bank	Either Kramer A-Bank and Solar PV Generator (P3)	87.2%	73.8%	109.4%	142.7%

### Summary of Short-Circuit Duty Results

Scenario	Post – New Kramer A-Bank Project				Post – New Kramer A-Bank Project with Circuit Breaker Replacement			
	Eff 3PH SCD	CB Loading	Eff SLG SCD	CB Loading	Eff 3PH SCD	CB Loading	Eff SLG SCD	CB Loading
2034	26.9 kA	85.4%	30.9 kA	98.2%	26.9 kA	53.8%	30.9 kA	61.8%
2039	27.4 kA	86.9%	31.4 kA	99.8%	27.4 kA	54.8%	31.4 kA	62.8%

### Summary of Alternatives

Alternatives	Risks
<b>Kramer RAS Contingency Addition (Trip Load)</b>	<ul style="list-style-type: none"> <li>Limits flow across the Kramer A-Banks.</li> <li>RAS should have a long-term solution i.e., Kramer 3A Bank.</li> </ul>

# 6. Tortilla 115 kV Capacitor Replacement

## Project Need and Purpose

- Mitigate low voltage issues during normal system conditions and system instability for the loss of the Coolwater-SEGS-Tortilla 115 kV line.

## Proposed Scope

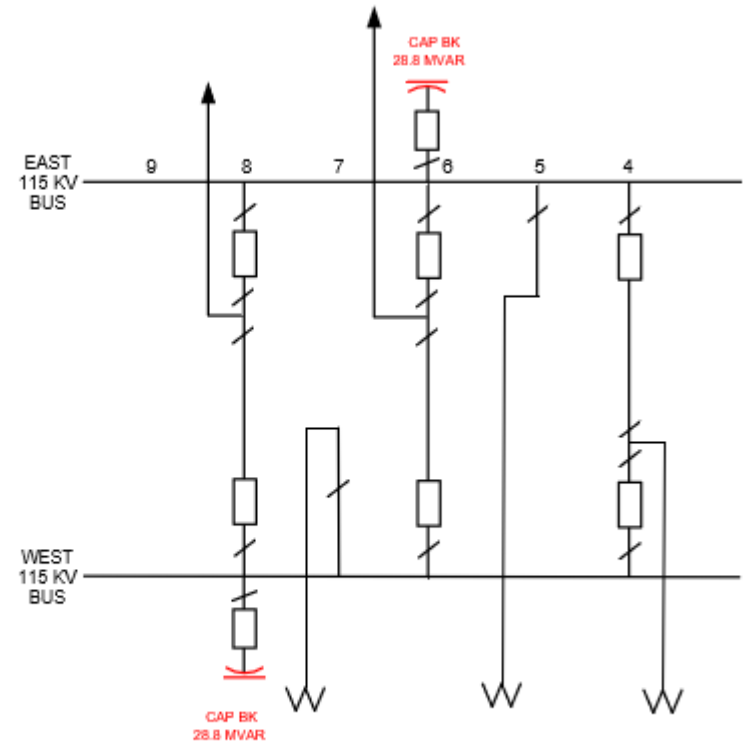
- Replace existing two (2) 14.4 MVAR capacitors with two (2) 28.8 MVAR capacitors.

## Impact of Proposed Project

- Helps address low voltage issues.

## Alternatives

- Loop Kramer-Coolwater 115 kV line into Tortilla 115 kV Substation.
- Battery energy storage for grid support. Further analysis required.



### LEGEND

- Existing
- Proposed

Main System	Estimated Cost	Proposed ISD
North of Lugo	\$5 M	06/30/2029



## 6. Tortilla 115 kV Capacitor Replacement

### Steady State Voltage Results for Peak ATRA Cases

Substation	Contingency (Category)	2026	2029	2034*	2039*
<b>Accelerate 115 kV</b>	None (P0)	N/A	0.928	0.948	DIV
<b>Accelerate 115 kV</b>	Kramer-Accelerate 115 kV or Accelerate-Tortilla 115 kV lines (P1)	N/A	0.819	DIV	DIV
<b>Tortilla 115 kV</b>	None (P0)	>0.95	0.925	0.944	DIV
<b>Tortilla 115 kV</b>	Kramer-Accelerate 115 kV or Accelerate-Tortilla 115 kV lines (P1)	>0.95	0.821	DIV	DIV
<b>Coolwater 115 kV</b>	Kramer-Accelerate 115 kV or Accelerate-Tortilla 115 kV lines (P1)	>0.95	0.942	DIV	DIV

\*Fictitious capacitors placed on various buses within the case to allow the case to be solved. Additional capacitors may cause inconsistent voltage readings on buses.

### Summary of Alternatives

Alternatives	Risks
<b>Execute only the looping of the Kramer-Coolwater 115 kV line into the Tortilla 115 kV Substation (Proposed project #4)</b>	<ul style="list-style-type: none"> <li>Mitigates thermal overloads and provides some additional VAR support; however, low voltage issues will still be present in later years.</li> <li>Cost savings do not justify the small project cost of the additional capacitors.</li> </ul>
<b>Battery energy storage system (BESS) dispatched to match peak load demands</b>	<ul style="list-style-type: none"> <li>BESS charging could hinder the ability to serve future load requests in this area.</li> <li>Charging the BESS during off-peak hours could reduce the cooling cycle effectiveness of other infrastructure equipment, such as transformers</li> <li>Considerably higher costs.</li> </ul>

# 7. Pardee-Vincent No.2 230 kV Line Upgrade

## Project Need and Purpose

- Thermal overload on Pardee-Vincent No. 2 230kV line when both Pardee-Sylmar No. 1 and No. 2 230 kV lines are loss under a P7 contingency.

## Proposed Scope

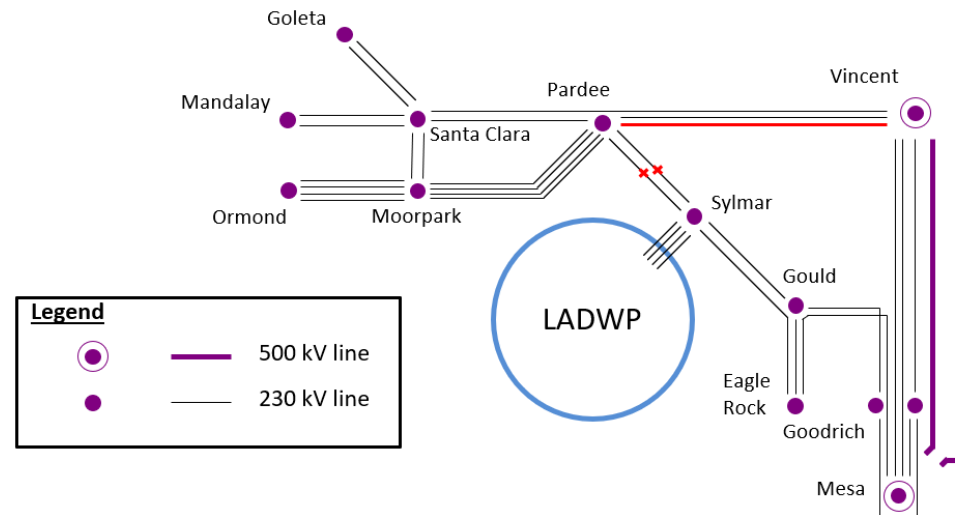
- Raise approximately seven (7) structures and reconductor approximate 34 miles with HTLS conductor to achieve minimum 1,699 A emergency rating.

## Impact of Proposed Project

- Mitigates line overloading that occurs during contingency outages under summer peak loading conditions.
- The project has been identified as a conceptual ADNU needed to address the Pardee-Sylmar area deliverability constraint. Consequently, SCE can not only address the reliability concerns but also realize the benefits of additional deliverable capacity.

## Alternatives

- Redispatch approximately 200 MW of energy storage at Moorpark.



Main System	Estimated Cost	Proposed ISD
Metro Area	\$68 M	12/31/2033

## 7. Pardee-Vincent No.2 230 kV Line Upgrade

### Power Flow Results for Peak ATRA Cases

Overloaded Facility	Contingency (Category)	Pre-Mitigation Loading				Post-Mitigation Loading
		2026	2029	2034	2039	2039
<b>Pardee-Vincent No. 2*</b>	Pardee-Sylmar No. 1 and No. 2 230 kV lines (P7)	<100	<100	<100	108.9%	69%

\*Line ratings: 1,160 A Normal and 1,560 A Emergency

# 8. Serrano 500 kV SCD Upgrade

## Project Need and Purpose

- In the 2022-2023 TPP, the CAISO approved 4th 500/230 kV AA transformer, 230 kV GIS rebuild to 80 kA capability, and two new 500 kV transmission lines into the Serrano Substation.
- The new transmission lines further increase short circuit duty at the Serrano Substation.

## Proposed Scope

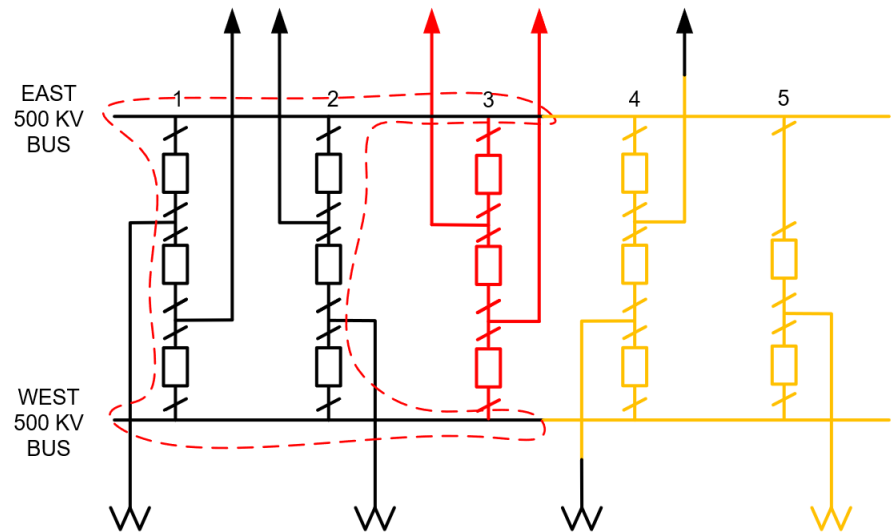
- Replace 500 kV GIS bus positions 1 through 3 with 63 kA-rated equivalent equipment.

## Impact of Proposed Project

- Mitigates increased short circuit duty caused by new lines
- Maintains substation equipment within its ratings.
- Nominal cost when bus split is done with the already approved project.

## Alternatives

- None.



ORANGE – New Construction, Approved 2022-2023 TPP Reliability Project

RED – New Construction, Approved 2022-2023 TPP Policy Projects

– New Construction, Proposed 2024-2025 TPP Reliability Project

Main System	Estimated Cost	Proposed ISD
Metro Area	\$183 M	12/31/2029

## 8. Serrano 500 kV SCD Upgrade

### Summary of Short-Circuit Duty Results

Scenario	Pre-Serrano 500 kV SCD Mitigation		Post-Serrano 500 kV SCD Mitigation	
	Eff 3PH SCD	CB Loading	Eff 3PH SCD	CB Loading
<b>2029</b>	38.2 kA	<b>95.4%</b>	38.2 kA	60.6%
<b>2034</b>	48.2 kA	<b>120.5%</b>	48.2 kA	76.5%
<b>2039</b>	48.4 kA	<b>121.0%</b>	48.4 kA	76.8%

# 9. Serrano 230 kV GIS Bus Split

## Project Need and Purpose

- In the 2022-2023 TPP, the CAISO approved 4th 500/230 kV AA transformer, 230 kV GIS rebuild to 80 kA capability, and two new 500 kV transmission lines into the Serrano Substation.
- The new transmission lines further increase short circuit duty at the Serrano and Villa Park Substations.

## Proposed Scope

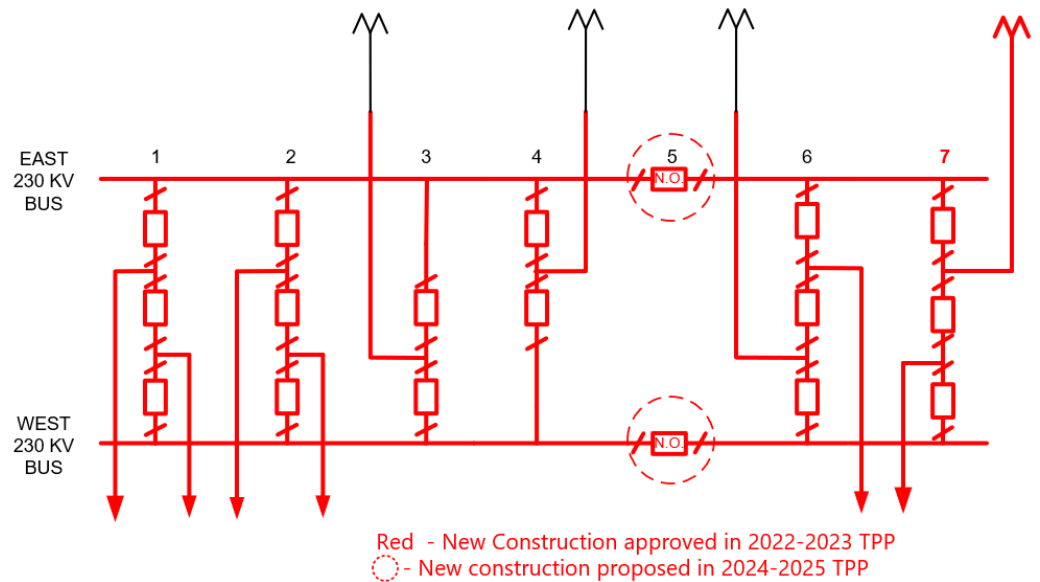
- Sectionalize 230 kV GIS bus.

## Impact of Proposed Project

- A split bus arrangement limits duty to the circuit breaker capability and increases operational flexibility.
- Maintains substation equipment within its ratings.
- Nominal cost when bus split is done with the already approved project.

## Alternatives

- None.



Main System	Estimated Cost	Proposed ISD
Metro Area	\$28 M	12/31/2029

## 9. Serrano 230 kV GIS Bus Split

### Summary of Short-Circuit Duty Results

Scenario	Pre-Serrano 500 kV SCD Mitigation		Post-Serrano 500 kV SCD Mitigation	
	Eff 3PH SCD at Villa Park 230 kV	CB Loading at Villa Park 230 kV	Eff 3PH SCD at Villa Park 230 kV	CB Loading at Villa Park 230 kV
<b>2029</b>	58.4 kA	92.8%	50.2 kA	79.7%
<b>2034</b>	62.9 kA	<b>99.9%</b>	52.2 kA	82.9%
<b>2039</b>	63.1 kA	<b>100.2%</b>	48.8 kA	83.0%

# 10. Alamitos 230 kV SCD Upgrade

## Project Need and Purpose

- In the 2022-2023 TPP, the CAISO approved the Serrano–Del Amo–Mesa 500 kV Transmission Reinforcement Project, which includes the new Del Amo 500 kV switchyard, further increasing short circuit duty at Alamitos 230 kV Substation.

## Proposed Scope

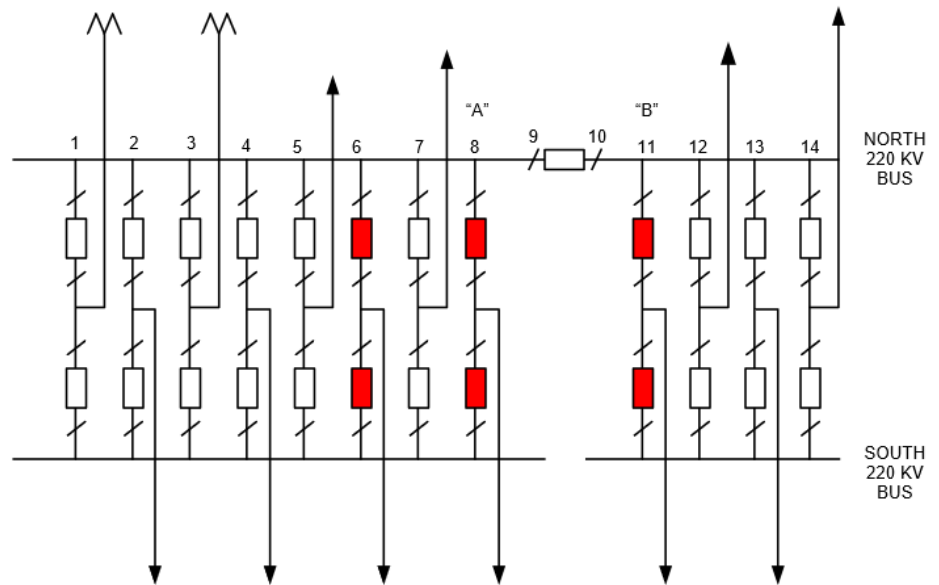
- Replace six (6) CBs at Alamitos A and B 230 kV to 63 kA.

## Impact of Proposed Project

- Increasing the CB rating will increase the substation’s capacity while not restricting power flow.
- Nominal cost when bus done with the already approved project.

## Alternatives

- None.



Red – New construction proposed in 2024-2025 TPP

Main System	Estimated Cost	Proposed ISD
Metro Area	\$5 M	12/31/2032



# 10. Alamitos 230 kV SCD Upgrade

## Summary of Short-Circuit Duty Results

Location   Scenario	Pre-Alamitos 230 kV SCD Mitigation		Post-Alamitos 230 kV SCD Mitigation	
	Eff 3PH SCD	CB Loading	Eff 3PH SCD	CB Loading
<b>Alamitos A   2034</b>	43.9 kA	<b>109.7%</b>	43.9 kA	69.6%
<b>Alamitos A   2039</b>	44.3 kA	<b>110.7%</b>	44.3 kA	70.3%
<b>Alamitos B   2034</b>	42.9 kA	<b>107.2%</b>	42.9 kA	68.1%
<b>Alamitos B   2039</b>	43.3 kA	<b>108.4%</b>	43.3 kA	68.8%

# 11. Santa Clara-Vincent 230 kV Advanced Reconductor

## Project Need and Purpose

- Santa Clara-Vincent 230kV Line overload (P7, 2039).
- The Moorpark-Pardee Constraint in the Ventura area has 3,530 MW transmission plan capability and 1,800 MW incremental from identified ADNU project upgrades, including the upgrade of the Santa Clara – Vincent 230 kV line with FCDS estimated ISD of 2034.

## Proposed Scope

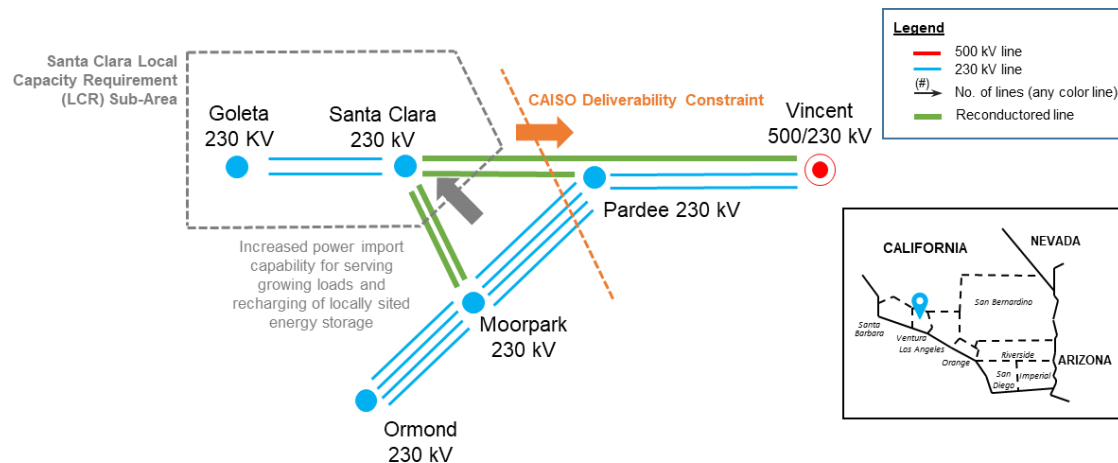
- Reconductor ~40 miles of existing line with high temperature low sag (HTLS) advanced conductor.
- Upgrade terminal equipment at Santa Clara Substation and select towers to support new conductor.

## Impact of Proposed Project

- Addresses P7 thermal overloads.
- Increases the normal rating of the existing line to 194% (2,230 A) of its present rating and the 4-hour emergency rating to 192% (2,380 A) of its present rating.
- This line upgrade along with other identified ADNUs can help renewable generation projects currently in queue to come online sooner.

## Alternatives

- None.



Main System	Estimated Cost <sup>1</sup>	Proposed ISD <sup>2</sup>
Metro Area	\$85 M	12/31/2031

1. Costs to be partially subsidized by "CHARGE 2T" DOE grant. Actual amounts pending grant negotiations.
2. Proposed In-service Dates pending grant negotiation and may be subject to change.

# 12. Moorpark-Santa Clara #1 230 kV Advanced Reconductor

## Project Need and Purpose

- Moorpark-Santa Clara overloads (P6 and P7, 2039).
- Limited transmission capacity into the Santa Clara LCR subarea to support growing loads at Santa Clara and Goleta and integrate (charge) additional energy storage.

## Proposed Scope

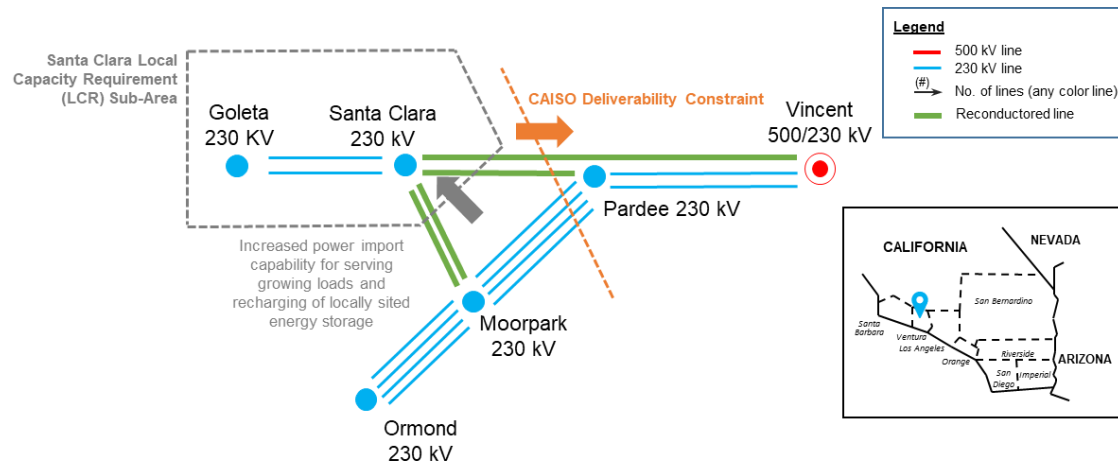
- Reconductor approximately 25 miles of existing line with high temperature low sag (HTLS) advanced conductor.
- Upgrade terminal equipment at Santa Clara Substation and select towers to support new conductor.

## Impact of Proposed Project

- Addresses P6 and P7 thermal overloads.
- Increases the normal rating of the existing line to 186% (2,230 A) of its present rating and the 4-hour emergency rating to 157% (2,380 A) of its present rating.
- Increases deliverability and integration of new resources and storage within the area.

## Alternatives

- None.



Main System	Estimated Cost <sup>1</sup>	Proposed ISD <sup>2</sup>
Metro Area	\$55 M	06/01/2029

1. Costs to be partially subsidized by "CHARGE 2T" DOE grant. Actual amounts pending grant negotiations.
2. Proposed In-service Dates pending grant negotiation and may be subject to change.

## 12. Moorpark-Santa Clara #1 230 kV Advanced Reconductor

Moorpark – Santa Clara No. 1 230kV Line Overload Mitigation, assuming a 4-hr emergency rating before reconductoring of 1,520 A and a 4-hr emergency rating after reconductoring of 2,380A.

Case	Contingency (Category)	Loading Before/After Reconductoring
<b>2039 Summer Peak</b>	Pardee-Santa Clara and Moorpark-Santa Clara No. 2 230 kV lines (P6)	104% / 66%
<b>2039 Summer Peak with S3 Sensitivity</b>	Pardee-Santa Clara and Moorpark-Santa Clara No. 2 230 kV lines (P6)	103% / 66%

# 13. Moorpark-Santa Clara #2 230 kV Advanced Reconductor

## Project Need and Purpose

- Moorpark-Santa Clara overloads (P6 and P7, 2039).
- Limited transmission capacity into the Santa Clara LCR subarea to support growing loads at Santa Clara and Goleta and integrate (charge) additional energy storage.

## Proposed Scope

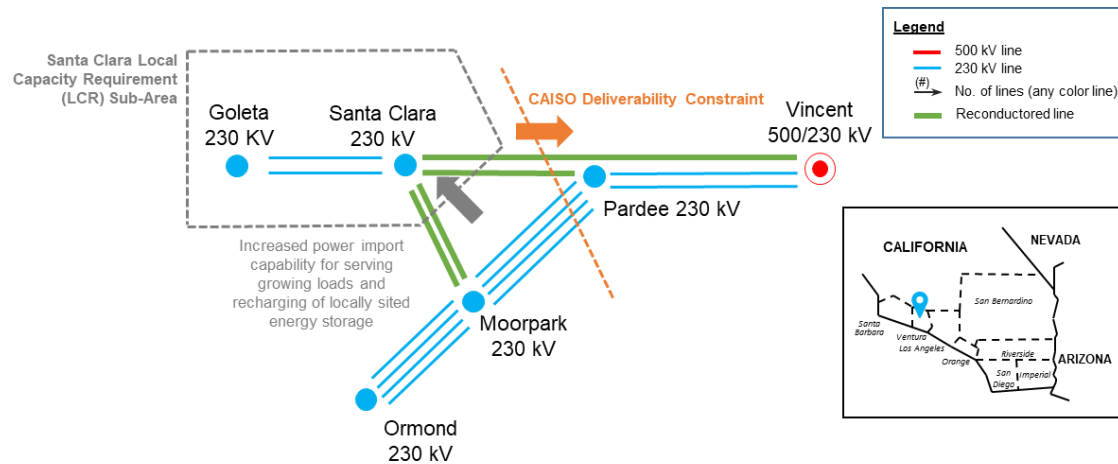
- Reconductor approximately 25 miles of existing line with high temperature low sag (HTLS) advanced conductor.
- Upgrade terminal equipment at Santa Clara Substation and select towers to support new conductor.

## Impact of Proposed Project

- Addresses P6 and P7 thermal overloads.
- Increases the normal rating of the existing line to 194% (2,230 A) of its present rating and the 4-hour emergency rating to 180% (2,380 A) of its present rating.
- Increases deliverability and integration of new resources and storage within the area.

## Alternatives

- None.



Main System	Estimated Cost <sup>1</sup>	Proposed ISD <sup>2</sup>
Metro Area	\$55 M	06/01/2029

1. Costs to be partially subsidized by "CHARGE 2T" DOE grant. Actual amounts pending grant negotiations.
2. Proposed In-service Dates pending grant negotiation and may be subject to change.

# 13. Moorpark-Santa Clara #2 230 kV Advanced Reconductor

Moorpark – Santa Clara No. 2 230kV Line Overload Mitigation, assuming a 4-hr emergency rating before reconductoring of 1,520 A and a 4-hr emergency rating after reconductoring of 2,380A.

Case	Contingency (Category)	Loading Before/After Reconductoring
<b>2039 Summer Peak</b>	Pardee-Santa Clara and Moorpark-Santa Clara No. 1 230 kV lines (P6)	119% / 62%
<b>2039 Summer Peak</b>	Pardee-Santa Clara 230 kV and Santa Clara-Vincent 230 kV lines (P7)	105% / 58%
<b>2039 Summer Peak with S3 Sensitivity</b>	Pardee-Santa Clara and Moorpark-Santa Clara No. 1 230 kV lines (P6)	119% / 66%
<b>2039 Summer Peak with S3 Sensitivity</b>	Pardee-Santa Clara 230 kV and Santa Clara-Vincent 230 kV lines (P7)	105% / 58%

# 14. Pardee-Santa Clara 230 kV Advanced Reconductor

## Project Need and Purpose

- Pardee-Santa Clara 230 kV overload (P7, 2034 and 2039).
- Limited transmission capacity into the Santa Clara LCR subarea to support growing loads at Santa Clara and Goleta and integrate (charge) additional energy storage.

## Proposed Scope

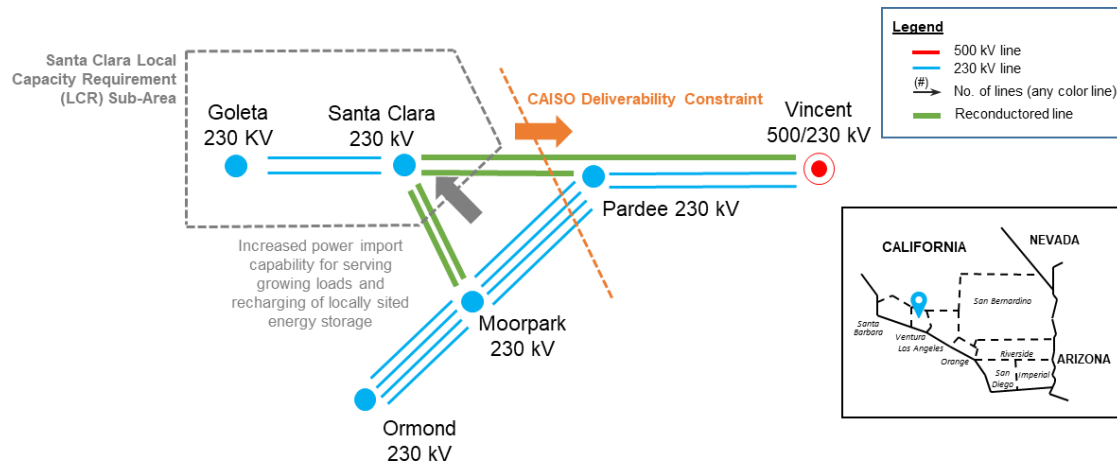
- Reconductor approximately 40 miles of existing line with high temperature low sag (HTLS) advanced conductor.
- Upgrade terminal equipment at Santa Clara Substation and select towers to support new conductor.

## Impact of Proposed Project

- Addresses above P7 thermal overloads.
- Increases the normal rating of the existing line to 194% (2,230 A) of its present rating and the 4-hour emergency rating to 180% (2,380 A) of its present rating.
- Increases deliverability and integration of new resources and storage within the area.

## Alternatives

- None.



Main System	Estimated Cost <sup>1</sup>	Proposed ISD <sup>2</sup>
Metro Area	\$71 M	04/01/2030

1. Costs to be partially subsidized by "CHARGE 2T" DOE grant. Actual amounts pending grant negotiations.
2. Proposed In-service Dates pending grant negotiation and may be subject to change.

# 14. Pardee-Santa Clara 230 kV Advanced Reconductor

Pardee – Santa Clara 230kV Line Overload Mitigation, assuming a 4-hr emergency rating before reconductoring of 1,240 A and a 4-hr emergency rating after reconductoring of 2,380A.

Case	Contingency (Category)	Loading Before/After Reconductoring
<b>2034 Summer Peak</b>	Moorpark-Santa Clara No. 1 and No. 2 230 kV lines (P7)	103% / 54%
<b>2039 Summer Peak</b>	Moorpark-Santa Clara No. 1 and No. 2 230 kV lines (P7)	126% / 66%
<b>2039 Summer Peak with S3 Sensitivity</b>	Moorpark-Santa Clara No. 1 and No. 2 230 kV lines (P7)	126% / 66%



# 15. Julian Hinds-Mirage 230 kV Advanced Reconductor

## Project Need and Purpose

- Julian Hinds-Mirage 230 kV line is thermally limited and subject to RAS that frequently trips generation.
- Historical data shows RAS has operated 10 times between 2019-2023, tripping over 100 MW each instance and totaling about 1.46 GW in curtailment.

## Proposed Scope

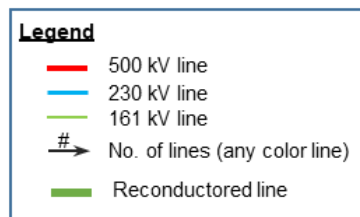
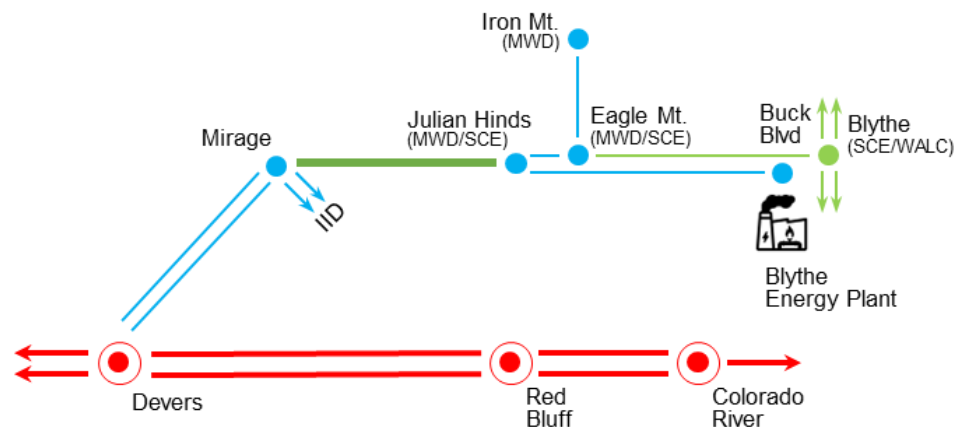
- Reconductor ~47 miles of existing line with high temperature low sag (HTLS) advanced conductor.
- Upgrade select towers to support new conductor.
- Modify existing Blythe RAS.

## Impact of Proposed Project

- Increases the normal rating of the existing line to 170% (1,525 A) of its present rating and the 4-hour emergency rating to 182% (1,625 A) of its present rating.
- Reduces the frequency of RAS gen tripping.
- Helps incorporate additional renewables along parallel transmission corridors.
- Increases reliability of service between neighboring systems (SCE, MWD, WAPA, IID).

## Alternatives

- None.



Main System	Estimated Cost <sup>1</sup>	Proposed ISD <sup>2</sup>
Eastern	\$76 M	04/01/2030

1. Costs to be partially subsidized by "CHARGE 2T" DOE grant. Actual amounts pending grant negotiations.
2. Proposed In-service Dates pending grant negotiation and may be subject to change.

# 16. Magunden-Springville No. 2 230 kV Advanced Reconductor

## Project Need and Purpose

- Drought, increased temperatures, and the threat of wildfires (2020 Creek Fire) can limit Big Creek Hydro generation output.
- Increased dependence on the power transfer capability of lines north of SCE's Magunden Substation to import power and serve area load at Rector, Vestal, and Springville.

## Proposed Scope

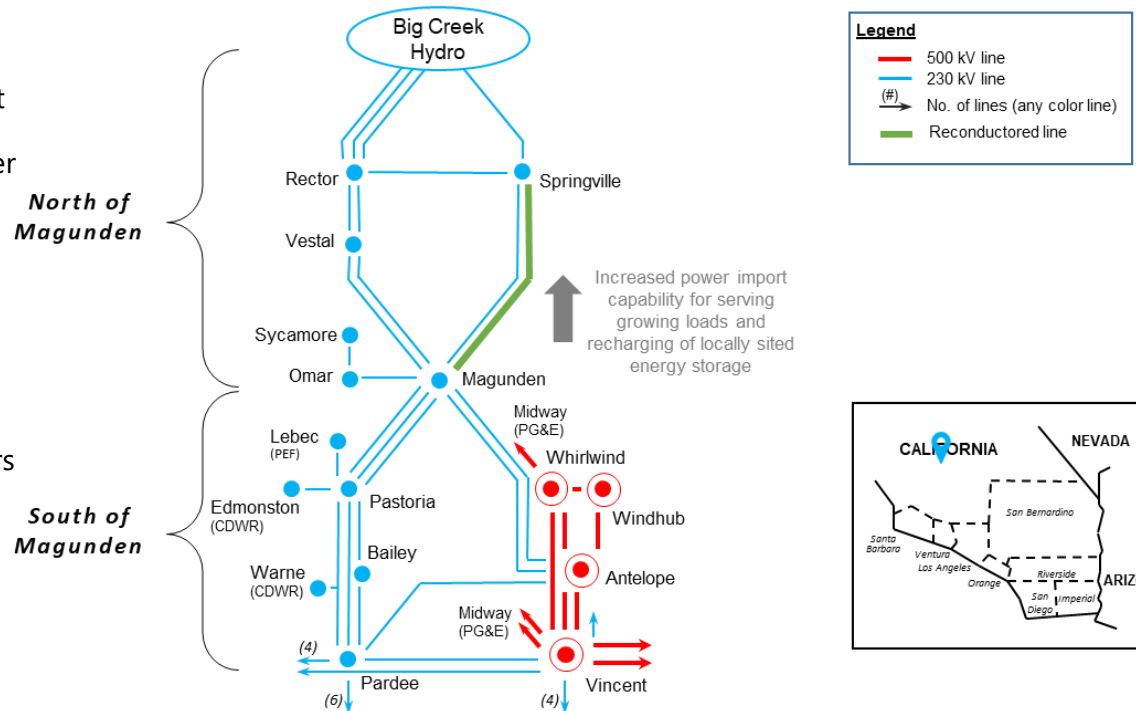
- Reconductor ~52 miles of existing line with high temperature low sag (HTLS) advanced conductor.
- Upgrade terminal equipment at Magunden and Springville substations and select towers to support new conductor.

## Impact of Proposed Project

- Increases the normal rating of the existing line to 134% (1,200 A) of its present rating and the 4-hour emergency rating to 172% (1,625 A) of its present rating.
- Increases deliverability and integration of new resources and storage within the area.
- Improves Big Creek/North of Magunden system resiliency under low hydro/high load conditions.

## Alternatives

- None.



Main System	Estimated Cost <sup>1</sup>	Proposed ISD <sup>2</sup>
Big Creek Corridor	\$96 M	06/01/2029

1. Costs to be partially subsidized by "CHARGE 2T" DOE grant. Actual amounts pending grant negotiations.
2. Proposed In-service Dates pending grant negotiation and may be subject to change.