



Together, Building
a Better California

Transmission Development Forum

Generation Interconnection Project (GIP) Upgrades
and Transmission Planning Process (TPP)
Upgrade Status

Oct 28, 2022



Presentation Summary

- PG&E fully supports the Transmission Development Forum to share Generation Triggered Reliability and Deliverability project status to all stakeholders.
- PG&E workbooks capturing Generator Interconnection Projects (GIP) and Transmission Planning Process (TPP) project statuses. The Excel Workbook contains projects that have been triggered by Interconnection Agreements while it may not show upgrades not yet triggered by an interconnection agreement.
- This presentation provides updates and the opportunity for discussion on the status of GIP and TPP projects that have generation interconnection dependencies. This is a technical discussion on the projects.
- PG&E requests that stakeholders save questions until the completion of each slide. Projects have been grouped to enable efficient and productive discussion.



PG&E Projects Status Summary

TPP Projects with Improvements

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	North Tower 115 kV Looping Project	Initiating	Q1-2028	Q4-2030	Q1-2030	Q4 Notes: Schedule Improvement. Further refinement to scope & schedule subject to change through the design process.
TPP	Round Mountain 500 kV Dynamic Voltage Support This project will support connection of the new 500kV substation between Round Mountain (RM) and Table Mountain (TM) Substations to the PG&E system. The new 500kV substation, installed by the third party (LS	In-Flight	Q4-2022	Q3-2024	Q2-2024	Q4 Notes: The August 2024 date was a scheduling tool error and has been corrected to bring date back to Spring 2024.
TPP C11P2-NP02 C11P2-NP01	Contra Costa PP 230 kV Line Terminals Reconfiguration Project Replaces need for: Contra Costa 230kV Bus Sections D, E and F and circuit breaker 820 overload Contra Costa 230kV SW's 601, 603 overload	In-Flight	Q4-2023	Q3-2025	Q1-2025	Q4 Notes: Schedule Improvement. Further refinement to scope & schedule subject to change through the design process.

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PG&E Projects Status Summary

TPP Projects with Delays (3+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	Kasson – Kasson Junction 1 115 kV Line Section Reconductoring Project Reconductor the Kasson -Kasson Junction 1 (~0.08 miles) 115 kV line section with larger conductor and replace structure, if necessary. Replace limiting terminal equipment at Kasson sub.	In-Flight	Q3-2026	Q2-2026	Q3-2026	Q4 Notes: Awaiting PM Assignment
TPP	Manteca #1 60 kV Line Section Reconductoring Project Reconductor ~1.13 miles of the Manteca #1 60 kV Line with larger conductor and remove any limiting component as necessary.	In-Flight	Q3-2026	Q2-2026	Q4-2026	Q4 Notes: Awaiting PM Assignment
TPP	Vaca Dixon Area Reinforcement (INSTALL (2) CAPACITOR BANKS)	In-Flight	Q3-2025	Q3-2025	Q4-2025	Q4: Reason for Delay is PEA/permit to purchase the land is in progress (project cannot proceed without purchasing the land); PTC permit will take up to 2 years
TPP	Wilson 115 kV Area Reinforcement Install new 115 kV and 230 kV Breaker-and-a-half (BAAH) Bus Arrangements, two Modular Protection and Automation Control (MPAC) Buildings, and two new 230/115 kV Transformers.	In Flight	Q2-2025	Q3-2027	Q1-2028	Q4 Notes: Work reprioritization.

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TPP Projects with Delays (3+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	Estrella Substation Project Construct and own the new Estrella 230/70/21 kV Substation and associated transmission line work as defined by the CAISO's Transmission Plan. Construct 230 kV and 70 kV transmission lines to connect the Morro Bay-Gates 230 kV and San Miguel-Paso Robles 70 kV lines via Estrella Substation. Reconductor the southernmost portion of the San Miguel-Paso Robles 70 kV line between Estrella and Paso Robles Substations.	In-Flight	Q4-2023	Q3-2026	Q1-2027	Q4 Notes: Permitting delays and unknown project scope until after PTC issuance is driving the project's in-service delays.
TPP	Oakland Clean Energy Initiative (MORAGA 115KV BUS UPGRADE & BK 3 SW) The project will install two bus-sectionalizing circuit breakers and one bus-tie breaker on the 115 kV buses at Moraga Substation, which will improve the reliability and operational flexibility of the buses. The project will also replace Bank 3 115kV switches 771, 773, 777, 779, 791, 793, & 795 which will improve the reliability and operational flexibility of the buses.	In-Flight	Q4-2021	Q3-2023	Q4-2023	Q4 Notes: Material delays by vendor pushed FISD to Nov 2023.
TPP	Rio Oso Area 230 kV Voltage Support Install a 230kV +200/-260 Mega Volt-Ampere reactive (MVAR) SVC at Rio Oso Substation	In-Flight	Q1-2024	Q3-2024	Q4-2024	Q4 Notes: Work reprioritization.

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PG&E Projects Status Summary

TPP Projects with Delays (6+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	Cottonwood 115 kV Bus Sectionalizing Breaker Replace Cottonwood Transformer Banks 1 & 4, replacement of six circuit breakers, addition of bus parallel circuit breaker, and upgrade the aging protection and control equipment at the Cottonwood substation.	In-Flight	Q4-2025	Q4-2024	Q1-2026	Q4 Notes: Work reprioritization
TPP	Martin 230 kV Bus Extension The Martin 230 kV Bus Extension project will: Construct a new 230 kV switching station near, but not adjacent to, Martin Substation. Relocate voltage control and power flow limiting equipment associated with the Jefferson-Martin and Martin-Embarcadero Cables from Martin, if necessary, to the new switching station. Completion of the Martin Bus Extension project will improve service reliability and system resiliency in serving customers in San Francisco and northern San Mateo County.	In-Flight	Q1-2024	Q2-2024	Q4-2025	Q4 Notes: Work reprioritization.
TPP	Red Bluff-Coleman 60 kV Reinforcement This project proposes to reconductor the Coleman-Red Bluff 60 kV line.	In-Flight	Q1-2026	Q3-2026	Q2-2030	Q4 Notes: Work reprioritization.

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TPP Projects with Delays (6+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	<p>Monta Vista 230 kV Bus Upgrade: Upgrade the 230kV transmission bus configuration at Monta Vista Substation in Cupertino to improve electric system resiliency. Phase 1:</p> <ul style="list-style-type: none"> • Installed the new 115/60 kV transformer • Connected the new transformer to 115 kV and 60 kV buses • Upgraded the 115 kV bus differential protection scheme • Removed the old 230/60 kV transformer <p>Phase 2:</p> <ul style="list-style-type: none"> • Reconnect the 230/115 kV No. 3 Transformer to the 230 kV bus position occupied by the old 230/60 kV transformer • Install new 230 kV bus-sectionalizing and bus-parallel breakers • Install new 230 kV MPAC building 	In-Flight	Q2-2018	Q2-2024	Q3-2025	Q4 Notes: Work reprioritization.
TPP	<p>Rio Oso 230/115 kV Transformer Upgrades: This project will resolve current configuration issues, address reliability and capacity concerns, and alleviate high- voltage issues at Rio Oso Substation. The upgrades to Rio Oso will also position the substation</p>	In-Flight	Q3-2022	Q2-2024	Q2-2025	Q4 Notes: Work reprioritization.
TPP	<p>Giffen Line Reconductoring Project: Reconductor approximately 5 miles of the Giffen 70 kV Tap Line with a conductor having summer emergency (SE) rating of at least 742 Amps (715 AAC conductor or equivalent)</p>	In-Flight	Q4-2023	Q1-2023	Q1-2024	Q4 Notes: Work reprioritization.
TPP	<p>Glenn 230/60 kV Transformer No. 1 Replacement: This project will replace GLENN Bank 1 with a new 230/60 kV, 200 MVA transformer with a Load Tap Changer (LTC) and parallel scheme under MWC-61</p>	In Flight	Q2-2020	Q4-2022	Q4-2023	Q4 Notes: Work reprioritization.

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TPP Projects with Delays (6+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	Ignacio Area Upgrade: Reconductor Ignacio - San Rafael No. 1 115 kV Line, Ignacio - Alto 60 kV Line, and Ignacio - San Rafael No. 3 115 kV Line section from Ignacio - Las Gallinas as well as upgrade limiting equipment on lines. Add a 10 MVAR shunt capacitor at Greenbrae 60 kV Substation and associated substation upgrades to accommodate this installation	Initiating	Q4-2026	Q4-2027	Q4-2028	Q4 Notes: Work reprioritization.
TPP	South of Mesa Upgrade: This project proposes to upgrade approximately 21.3 miles of conductor on the Sisquoc – Santa Ynez SW STA 115 kV Line, install 20 Mega Volt-ampere reactive (MVAR) shunt capacitors at Cabrillo Substation and install Remedial Action Scheme (RAS) (formerly known as Special Protection Scheme (SPS)) on the Sisquoc – Santa Ynez SW STA 115 kV Line.	In Flight	Q4-2025	Q2-2026	Q2-2027	Q4 Notes: Work reprioritization.
TPP	Wilson-Le Grand 115 kV line reconductoring: This project proposes to reconductor approximately 14 miles of the Wilson -LeGrand 115kV Line with 477 ACSS conductor or equivalent and replaces 146 wood poles with new light duty steel poles (LDSP). This project was recommended by the CAISO as a policy driven upgrade.. Completion of this project will provide additional transmission capacity to serve over 30,000 electric customers in Merced County.	In-Flight	Q1-2021	Q4-2022	Q1-2024	Q4 Notes: Le Grand Substation bus upgrade portion of work pushed out due to Work reprioritization. Wilson-LeGrand reconductoring completed in Dec 2021. LeGrand sub upgrade to be completed in Feb 2024 and is needed for line to achieve full rating

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PG&E Projects Status Summary

Generation Interconnection Project Upgrades

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
GIP 20rsmt-3	Midway 230 kV Bus Section E overload mitigation Replace limiting conductor and/or fittings on Bus Section E to achieve 3372 A min. rating	In-Service		Q3-2022	Q3-2022	Q4 Notes: In-Service
GIP C11P2-FC01	Midway 500kV CB's 722 Overstress Midway Sub: Replace 500kV CB's 722, SW's and Relays	In-Service	Q3-2022	Q3-2022	Q3-2022	Q4 Notes: In-Service
GIP C11P2-FP01	Midway 500 kV circuit breakers 732, 802, 832 and 842 overstress Replace Midway 500 kV circuit breakers 732, 802, 832 and 842 and associated switches/relays	In-Service	Q4-2022	Q3-2022	Q3-2022	Q4 Notes: In-Service
GIP C12P2-KC01	Midway Substation 500kV CB 722 Overload mitigation Replace Midway 500 kV CB 722 to achieve 3600 A emergency rating	In-Service	Q4-2022	Q3-2022	Q3-2022	Q4 Notes: In-Service
PG&E	Convert Midway Substation 230 kV to BAAH Convert Midway Substation 230 kV to BAAH in order to install bus reactors & RAS	In-Flight			Q2-2025	Q4 Notes: Work reprioritization.

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Generation Interconnection Project Upgrades

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GIP 21rsmt-1	Henrietta Substation 70kV CBs 12 and 72 Overstress Henrietta Sub: Replace 70kV CB 12 & 72 and switches.	In-Flight	Q2-2025	Q1-2025	Q3-2026	Q4 Notes: Work reprioritization.
GIP 21rsmt-5	Palo Alto 115 kV circuit breakers 412 and 442 overstress Replace Palo Alto 115 kV circuit breakers 412 and 442 with 63 kA interrupting capability	In-Flight	Q4-2026	Q2-2026	Q4-2027	Q4 Notes: Work reprioritization.
GIP 21rsmt-SCD-23	El Cerrito G 115kV CB 112, 142, 132 Overstress Replace Overstressed Circuit Breakers	In-Flight	Q1-2024	Q3-2024	Q4-2025	Q4 Notes: Work reprioritization.
GIP C12P1-GPT01	Ames Distribution 115 kV circuit breaker 132 overstress Replace Ames Distribution 115 kV circuit breaker 132	In-Flight	Q4-2025	Q3-2024	Q1-2026	Q4 Notes: Work reprioritization.
GIP C12P1-NPT01	Gold Hill Substation 115 kV circuit breakers 142 and 172 overstress Replace Gold Hill Substation 115 kV circuit breakers 142 and 172 and associated switches/relays	In-Flight	Q2-2024	Q4-2023	Q3-2025	Q4 Notes: Work reprioritization. Q2 2025 CB 142. Q3 2025 CB172
GIP C12P1-NPT03	Rio Oso Substation 115 kV circuit breakers 412, 422, 482, 522 and 542 overstress Replace Rio Oso Substation 115 kV circuit breakers 412, 422, 482, 522 and 542 and associated switches/relays	In-Flight	Q2-2021	Q4-2023	Q2-2024	Q4 Notes: Work reprioritization.

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GIP 22rsmt-3	Metcalf 230 kV Substation Circuit Breaker #No 292 Upgrade Upgrade Metcalf Circuit Breaker #292 due to overstress issues	In-Service		Q4-2025	Q3-2022	Q4 Notes: In-Service
GIP C13P1-GPN04	Metcalf Substation 230 kV capacitor circuit breakers 654, 664, 674 and 684 overstress Replace Metcalf Substation 230 kV capacitor circuit breakers 654, 664, 674 and 684	In-Flight	Q4-2024	Q2-2025	Q1-2026	Q4 Notes: Work reprioritization. Q4 2022 Interim Solution removes the overstress condition until CBs replaced.
GIP C11P2-NR01	Cottonwood Substation 230 kV circuit breakers 232, 242 overstress Replace Cottonwood Substation 230 kV circuit breakers 232, 242 and associated switches/relays	In-Flight	Q1-2025	Q2-2024	Q3-2025	Q4 Notes: Work reprioritization.
GIP C8P2-15	Cottonwood Substation 230 kV Circuit Breaker 522 and 542 Overstress Cottonwood Substation 230 kV CB Overstress: Replace CB 522 & 542 (rated @ 34.5KA, overstress close-in fault is 35,179A or 2%, 679A).	In-Flight	Q1-2023	Q3-2023	Q3-2024	Q4 Notes: Long Lead Time delay
PG&E	Morro Bay MPAC New 230kV MPAC building relocates 230kV equipment from existing Control Building	In-Flight	Q3-2025		Q1-2027	Q4 Notes: Work reprioritization impacting EGI projects depending on DTT and Point Of Interconnection at Morro Bay
PG&E	Tesla MPAC New 230kV MPAC building relocates 230kV equipment from existing Control Building	In-Flight	Q3-2024		Q4-2024	Q4 Notes: Work reprioritization impacting EGI projects depending on DTT and Point Of Interconnection at Morro Bay

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Generation Interconnection Project Upgrades

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GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 1) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q3-2021	Q2-2023	Q4-2024	Q4 Notes: Work reprioritization.
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 2 - incl CB282) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q2-2025	Q4-2023	Q4-2025	Q4 Notes: Work reprioritization.
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 3 - incl CB262) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q1-2026	Q4-2024	Q4-2026	Q4 Notes: Work reprioritization.
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 4 - incl CB182) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q1-2027	Q4-2025	Q4-2027	Q4 Notes: Work reprioritization.
GIP C12P2-GRNU2	Gates Substation 230 kV Bus Overstress Install series bus reactors between Gates Substation 230 kV bus sections E and F	In-Flight	Q1-2024	Q4-2025	Q1-2025	Q4 Notes: Schedule Improvement. Subject to change through the design process.
GIP C8P2-3	QC8RAS-08 RAS (Deliverability Triggered RNU) QC8RAS-08 RAS to trip Generation offline for outage AND overload of either Gates 500/230 kV Transformer Bank 11 or 12	In-Flight		Q4-2023	Q2-2024	Q4 Notes: Sequencing aligning with Gates 500kV STATCOM activities

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GIP C12P1-GCR01	Moraga 115 kV circuit breakers 582, 612, 622, 642 and 712 overstress Replace Moraga 115 kV circuit breakers 582, 612, 622, 642 and 712	Not Triggered	Q2-2029	Q4-2028	Q4-2029	Q4 Notes: Work reprioritization.
GIP C12P1-NPT04	Vaca Dixon Substation 230 kV circuit breakers 442, 452 and 462 overstress Replace Vaca Dixon Substation 230 kV circuit breakers 442, 452 and 462 and associated switches/relays	Initiating	Q3-2023	Q4-2024	Q1-2025	Q4 Notes: Work reprioritization.
GIP C11P2-ND03	North Dublin-Cayetano 230 kV Line Reconductor North Dublin-Cayetano 230 kV Line 2.63 miles OH Line & 2.82 UG cable with new UG cable 797 MVA/2000 A	In-Flight	Q4-2024	Q4-2025	Q1-2025	Q4 Notes: Schedule Improvement. Subject to change through the design process. Tracking to 30% Design complete by Dec 2022
GIP C9P1-F11	Re-conductor Dos Amigos PP-Panoche #3 230 kV Line Re-conductor 23.63 mi Dos Amigos PP-Panoche #3 230 kV Line with 795 ACSS	In-Flight	Q3-2024	Q2-2025	Q2-2025	Q4 Notes: 2022 Reassessment determined new Dos-Amigos-Panoche #3 Switching Station to be looped in with scope to remove Dos Amigos PP dependencies.
GIP 22rsmt-4	New 230 kV switching station to loop Dos Amigos – Panoche # 3 230 kV Build a new 2 bay 230 kV BAAH switching station to loop in the Dos Amigos – Panoche # 3 230 kV Line requiring access road, land and land rights acquisition and permitting, remote end protection upgrades, and OPGW/fiber telecommunication work	Initiating			Q4-2028	Q4 Notes: 2022 Reassessment determined new Dos-Amigos-Panoche #3 Switching Station to be looped in with scope to remove Dos Amigos PP dependencies.

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