



City of Palo Alto Utilities Comments on the CAISO 2020-2021 Draft Transmission Plan

The City of Palo Alto Utilities (CPAU or the City) appreciates the opportunity to comment on the CAISO's 2020-2021 Draft Transmission Plan (Draft Plan). The comments below address the Draft Plan posted by the CAISO on February 1, 2021, and the presentation made by the CAISO during the February 9, 2021 stakeholder meeting.

Summary

The PG&E system that the City is connected to, and continues to support through our transmission access charges, does not provide adequate reliability for the City and the critical regional facilities that the City serves¹. It is imperative that these facilities have reliable grid power to perform their daily operating routines without interruption. Although over the years several proposals have been considered by the CAISO, PG&E, and CPAU, the fundamental reliability issues faced by CPAU have remained unaddressed in the Draft Plan. CPAU intends to closely work with PG&E and the CAISO to develop robust transmission solutions to address the CPAU's reliability issues as part of the next transmission planning cycle.

The location of the three transmission lines serving Palo Alto in a single corridor does not provide adequate service reliability because a single event can (and has) cause the loss of all three lines.

The inadequate reliability is due to having all three-transmission lines that provide power to the City being located in a single corridor that is in close proximity to the end of a runway at a Santa Clara County General Aviation Airport. This corridor has been struck by an airplane twice. The last event occurred on February 17, 2010. The airplane caused **all three** lines to be interrupted and the outage lasted for 10 hours. Stanford Hospital was on the verge of starting to move patients to other hospitals when the power was finally restored. For two days following the aircraft impact, the entire City was served by a single wood pole 115kV line while PG&E crews worked to replace the destroyed double circuit transmission tower. This event had a significant effect on the businesses, hospitals, and residents in the city.

¹ These facilities include the Stanford Hospital's Regional Level 1 Trauma Center, VA Hospital, Lucile Packard Children's hospital, and the Regional Water Quality Control Plant.





There is an alternative solution that would have addressed both Palo Alto's and Stanford's reliability needs (Connecting City of Palo Alto's 60kV system to SLAC's 230kV substation) is no longer under consideration.

As the CAISO is aware, over the last decade, CPAU has been working on developing a solution that would have solved the issues in Palo Alto and provide the additional capacity to serve Stanford that was recommended in the Jefferson- Stanford #2 60 kV proposal.² This alternative solution would have connected the City of Palo Alto's 60kV system to SLAC National Accelerator Laboratory (SLAC)'s 230kV substation and loop through Stanford's Substations. Negotiations between the parties over a number of years did not produce a workable solution; thereby, in the interests of refining reliability for the City, CPAU has decided to pursue other resolutions.

The Draft Plan does not address CPAU's fundamental reliability issues.

CPAU acknowledges the CAISO and PG&E's efforts expected transmission overloads in the transmission serving the CPAU's load. In particular, the CAISO approved the following three transmission projects that address contingency overloads on the three 115kV lines serving the City load.

1. Cooley Landing 115/60 kV Transformer Capacity Upgrade (operational);
2. Cooley Landing-Palo Alto and Ravenswood-Cooley Landing 115 kV Lines Rerate (EOD: January 2022);³ and
3. Ravenswood – Cooley Landing 115 kV Line Reconductor (EOD: March 2022).⁴

However, even with the above-mentioned upgrades, the CAISO's reliability assessment conducted as part of the 2020-2021 TPP indicates that there continue to be P2 and P5 issues on the transmission lines serving the CPAU system in the year 2025 as shown in Table 1 below.

² CPAU comments on the CAISO 2010/2011 Draft, Transmission Plan, April 21, 2011. Palo Alto – SLAC Reliability Improvement Project Request Window Application, October 12, 2012.

³ PG&E AB 970 submittal, December 2020.

⁴ *Ibid.*





Table 1: Overloads on the Ravenswood-Cooley Landing #1 115kV Lines: CAISO Reliability Assessment⁵

Transmission Element	Loading in 2025 Summer Peak Case (%)	Contingency Description	Contingency Type	Identified Mitigation
Ravenswood-Cooley Landing #1 115kV Line	112%	RVNSWD E 115KV - SECTION 2E & 1E	P2	Ravenswood 115 kV bus upgrade
Ravenswood-Cooley Landing #2 115kV Line	113%	RAVENSWOOD 115 (FAILURE OF NON-REDUNDANT RELAY)	P5	Ravenswood 115 kV bus upgrade

CPAU investigated the effectiveness of the *Ames to Palo Alto 115kV* transmission project that was submitted by PG&E in the 2012-2013 TPP⁶ in addressing the NERC and CAISO planning criteria violation for the Ravenswood-Cooley Landing 115kV lines.⁷ We assumed the Ravenswood-Cooley Landing 115kV lines to be rerated, but not reconductored. The power flow results of this exercise are included in Table 2 below. It appears that the new *Ames to Palo Alto 115kV* line would be effective in eliminating the P2 overload (133% to 91%) on the Ravenswood-Cooley Landing 115kV lines. Table 2 also shows that there are no longer P1 and P7 overloads on the Ravenswood-Cooley Landing 115kV lines, which were the primary drivers for the original approval of the *Ravenswood-Cooley Landing 115kV* Reconductoring project in the CAISO 2009 Transmission Plan.⁸ The new *Ames to Palo Alto 115kV* line is also effective in lowering these P1 (from 65% to 62%) and P7 (71% to 55%) loadings on the Ravenswood-Cooley Landing 115kV lines. So, the solution to the three lines out event also solves the expected P2 overload on the *Ravenswood – Cooley Landing 115kV* line.

⁵ **Source:** See 2020-2021 ISO Reliability Assessment - Preliminary Study Results, PG&E Greater Bay Area, CAISO 2020-2021 TPP, August 15, 2020.

⁶ PG&E, Ames-Palo Alto 115 kV RW application, CAISO 2012-13 TPP, September 14, 2012.

⁷ This project entails building a new Ames-Palo Alto 115 kV Line. The new line will be about 4 miles long and utilize existing right-of-ways and vacant tower positions. Approximately 2 miles will be on a vacant position on the Cooley Landing-Los Altos 60 kV Line and Westinghouse 60 kV Tap line out of Ames Substation. The remainder of the line will be on an existing idle line into Palo Alto Switching Station or Adobe Creek (City of Palo Alto).

⁸ CAISO 2009 Transmission, Plan, March 2009, p.114-115.





Table 2: Loadings on the Ravenswood-Cooley Landing #1 115kV Lines: Without and With Ames-Palo Alto 115kV Project

Transmission Element	Rating (MVA)	Loading in 2025 Summer Peak Case (%)		Contingency Type	Contingency Description
		Without Project	With Project		
Ravenswood-Cooley Landing #1 115kV Line	189	133%	91%	P2	RVNSWD E 115KV - SECTION 2E & 1E
		65%	62%	P1	Ravenswood-Cooley Landing 115kV Circuit #2
		71%	55%	P7	Ravenswood-Palo Alto 115kV Circuits #1 and #2

In summary, there is an urgent need to identify a long-term solution to reliably serve the CPAU load. One such solution could be the *Ames to Palo Alto 115kV* transmission project. This project would potentially replace the need for the CAISO-approved *Ravenswood-Cooley Landing 115kV Reconductoring* project and is expected to have similar capital costs (~\$10-\$20 million). In other words, the *Ames-Palo Alto 115kV* project not only increases the capacity and reliability of the 115kV system serving Palo Alto, but also provides a 115kV interconnection outside the common corridor near the airport flight path. We, therefore, urge the CAISO to consider evaluating the *Ames to Palo Alto 115kV* transmission project and revisiting some of the previously approved projects need and scope.

CPAU appreciates the opportunity to comment on the Draft 2020-2021 Transmission Plan and acknowledges the significant effort of the CAISO staff in its development. We look forward to working with PG&E and the CAISO to develop needed transmission projects to address CPAU’s long overdue reliability issues.

Sincerely,

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