CITY OF PALO ALTO

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CITY COUNCIL
Monday, June 16, 2025
Council Chambers & Hybrid
5:30 PM

Agenda Item

11. Accept Electric System Reliability Key Performance Indices; CEQA – Not a Project

CITY OF PALO ALTO

City Council Staff Report

From: City Manager
Report Type: CONSENT CALENDAR
Lead Department: Utilities

Meeting Date: June 16, 2025
Report #:2506-4769

TITLE
Accept Electric System Reliability Key Performance Indices; CEQA – Not a Project

RECOMMENDATION
Staff recommends that the City Council accept Palo Alto's electric system reliability indices and recommended goals and reporting.

EXECUTIVE SUMMARY
As a common practice, publicly owned and investor-owned utilities track electric system reliability through indices that track the average frequency, duration, and restoration time of unplanned power outages. These indices include System Average Interruption Duration Index (SAIDI), System average Interruption Frequency Index (SAIFI), and Customer Average Interruption Duration Index (CAIDI). Since these indices are standardized across the utility sector, they provide a good measure of system performance and the ability to compare performance between various utility systems. Palo Alto's electric system reliability shows improvement over time and compares favorably to other utilities within the region and nationally. These metrics are reported quarterly to the Utilities Advisory Commission (UAC); staff recommend prospectively to continue this practice and, forward this reporting to the City Council with the addition of at least annual comparisons of Palo Alto's performance to adjacent systems (PG&E) and nationally to the City Council as an information item. This additional reporting will ensure heightened awareness of these metrics as the City continues to work to achieve its reliability and electrifications goals.

BACKGROUND
On a quarterly basis, City staff present outage indices to the Utility Advisory Commission. As an industry standard, power outages and overall system reliability are tracked through standardized indices that track average system performance over a defined period, typically 12 months. Three indices are used to track the average duration of outages (SAIDI), average frequency of outages (SAIFI), and the average restoration times for customers experiencing outages (CAIDI). Presentation of this data provides the UAC and City Council with an ongoing indication of system

performance and the impact of newly implemented operating procedures, replacement of legacy equipment, and the implementation of modern utility equipment.

The City Council has established these three electric reliability metrics as Key Performance Indicators (KPI) and tasked City staff with recommending goals for reliability metrics and standardized reporting methodology. This staff report presents current reliability metrics for Palo Alto based upon outage data through the third quarter of fiscal year 2025, recommendations for a reporting methodology, and annual reliability goals.

Below is a brief overview of these metrics.

- **SAIDI (System Average Interruption Duration Index):** This measures the average duration of a power outage for the average customer within a given period (usually a year). A lower SAIDI means customers experience less time without power, indicating better overall reliability.
- **SAIFI (System Average Interruption Frequency Index):** This measures how often the average customer should expect to experience a power outage over a given period (typically 12-months). A lower SAIFI means customers experience fewer power outages, indicating better service reliability.
- **CAIDI (Customer Average Interruption Duration Index):** This measures the average time it takes to restore service to customers who have experienced an outage. A lower CAIDI generally means utilities are able to restore power more quickly when outages do occur, reflecting efficient outage response and quick restoration times.

In essence, these metrics are used by utilities to assess and improve the reliability of their electrical distribution systems. Lower values across all three indicate a more reliable and efficient power supply for customers.

ANALYSIS

For Fiscal Year 2025, Palo Alto's system reliability numbers are improved from FY 2023 and FY2024. Some of the improvements can be attributed to changes in system restoration procedures while some improvements are due to milder winter weather. Impacts of weather and large system outages are seen when comparing the SAIDI, SAIFI, and CAIDI numbers on the left side of the chart below (Major Event Days Included) against the right side (Major Event Days Excluded).

	Major Event Days Included			Major Event Days Excluded		
FY	**SAIDI**	**SAIFI**	**CAIDI**	**SAIDI**	**SAIFI**	**CAIDI**
2019	114.7	0.935	122.7	44.4	0.330	134.6
2020	63.9	0.486	131.4	26.2	0.248	105.6
2021	70.6	0.720	98.1	14.7	0.053	279.9
2022	7.2	0.159	45.4	1.2	0.009	132.8
2023	148.9	1.378	108.0	26.1	0.164	159.6
2024	141.4	0.691	204.5	66.8	0.385	173.5
2025*	82.8	0.630	131.4	38.4	0.252	152.5

**FY2025 numbers are preliminary and represent outages through the first three quarters of the current fiscal year. Final numbers will be updated after the FY ends and all outage data can be reviewed for accuracy.*

Two sets of numbers are presented for the current and past fiscal years. One set represents all primary level outages (excludes single transformer and single customer outages), and a second set of data removes Major Event Days (MED) from the data to remove the influence of significant weather events or other large outages that do not represent normal day-to-day operations. By identifying and removing MEDs from the outage indices, year over year trends can be established to better indicate if system performance is improving or declining. For the data presented, MED are defined as 24-hour periods with more than 10 percent of Palo Alto's electric customers impacted by power outages.

Tracking the City's year-to-year reliability indices is a good measure of internal progress toward improved reliability but does not provide an indicator of industry-wide (national) or regional system reliability. The charts further below present PG&E's outages indices for the DeAnza Division and American Public Power Association's (APPA) tracking of nationwide system reliability. PG&E's DeAnza Division, which covers the cities and surrounding areas of Cupertino, Los Altos, Los Gatos, and Mountain View, represents our local region's electric system reliability and the impacts of local weather events. APPA's collection of nationwide system reliability is narrowed to show the cutoff for the best performing systems (top 25 percent) in the United States. Combined, these two comparisons provide additional relevance to Palo Alto's efforts to provide safe and highly reliable electric service. At the time of writing this staff report, 2024 data was not available for both PG&E's and APPA's system reliability numbers.

	PG&E DeAnza DISTRICT w/ MED			PG&E DeAnza DISTRICT w/o MED		
Calendar Year	**SAIDI**	**SAIFI**	**CAIDI**	**SAIDI**	**SAIFI**	**CAIDI**
2019	612.7	1.601	382.7	91.3	0.873	104.6
2020	249.6	1.433	174.1	83.1	0.711	117
2021	163.6	1.43	114.4	121	0.787	153.8
2022	207.3	1.689	122.7	120.4	1.001	120.3
2023	459.8	2.161	212.8	173.3	1.002	173

	National Indices With MED			National Indices Without MED		
Calendar Year	**SAIDI**	**SAIFI**	**CAIDI**	**SAIDI**	**SAIFI**	**CAIDI**
2019 Top Quartile POU	85.0	0.890	86.9	55.8	0.660	72.4
2020 Top Quartile POU	86.2	0.800	91.3	56.2	0.630	73.4
2021 Top Quartile POU	84.8	0.853	86.2	53.1	0.632	74.3
2022 Top Quartile POU	79.8	0.849	83.4	54.6	0.640	73.5
2023 Top Quartile POU	80.9	0.818	90.6	51.6	0.600	75.4
Five Year Average	83.3	0.842	87.7	82.9	0.632	73.8

In comparison of both regional and national outage reliability indices, staff is recommending Palo Alto set a goal of remaining within the five-year average of APPA's top quartile for all three indices (SAIDI, SAIFI, and CAIDI) when excluding MED. Staff is further recommending that Palo Alto, at all times, outperform PG&E's system reliability numbers for the DeAnza Division. Setting these targets will allow comparisons on a national level, regardless of weather events, and on a regional level including and excluding the impacts of localized weather events.

Future quarterly and annual presentations of outages indices will include these comparisons as the comparisons aid the UAC, City Council, and utility staff in identifying trends in system reliability.

FISCAL/RESOURCE IMPACT

This item contains no fiscal or resource impact. Future discussions may involve presentations of operating procedures, staffing, and recommended capital replacement projects intended to improve system performance.

STAKEHOLDER ENGAGEMENT

No stakeholder engagement was sought on this item as the data collected is internal to City departments and comparison data is available publicly.

ENVIRONMENTAL REVIEW

City Council action on this item is not a project as defined by CEQA because the City Council discussion of system reliability and goals is an administrative activity. CEQA Guidelines section 15378 (b)(2).

ATTACHMENTS

None.

APPROVED BY:

Alan Kurotori, Director of Utilities