

CASE STUDY / DEAD TANK GAS CIRCUIT BREAKER

ENHANCED INSTALLATION WITHIN AN EXISTING FOOTPRINT

When one of three transformers at a substation needed to be replaced, City of Palo Alto Utilities decided to install a circuit breaker as well. By allowing bidders to offer innovations and alternatives, the utility obtained a safer and improved installation.



DEAD TANK ALTERNATIVE PROVIDES ADDED BENEFITS AT SUBSTATION

Successful proposal demonstrated how enhanced equipment beyond the base bid could fit within the project site.

PROJECT STATS

CLIENT
City of Palo Alto Utilities

LOCATION
Palo Alto, California

COMPLETION DATE
November 2019

CHALLENGE

City of Palo Alto Utilities (CPAU) needed to replace a damaged transformer, one of three at its Colorado Power Station. Since the transformer and its bay would be out of service, the utility wanted to add a gas circuit breaker, as it already had on the other two bays.

The work needed to be performed at the energized substation, working carefully around the other bays to maintain continuity of service.

Recognizing the opportunity to make improvements, the utility provided a base bid in its request for proposal for design-build services to install a 123-kV live tank circuit breaker, but it encouraged bidders to present alternatives.

SOLUTION

CPAU selected Burns & McDonnell on the strength of its proposed alternatives. During a bid clarification meeting, we suggested an alternative to the base bid that would use a dead tank circuit breaker with bushing current transformers (CTs), as well as a new transmission line

dead-end structure accommodating three single-phase potential transformers (PTs) and a manually operated V-type disconnect.

The dead tank gas circuit breaker offered several advantages over the live-tank base proposal. Dead tank breakers have a shorter profile and are installed lower to the ground, which can be attractive in a seismically active area like the San Francisco Bay Area. The addition of the on-site disconnect provides a visual open point, which increases safety and access for construction and maintenance staff. Including bushing CTs allows for better protection zones to be implemented, which improves protection coordination.

Together, these attributes provided an improved installation within the same bay footprint and on a schedule that was only slightly longer than the live tank breaker base bid.

We applied our extensive experience working on substations and with engineer-procure-construct (EPC) project delivery to manage all aspects of design and construction with

ONE OF

3

BAYS AT SUBSTATION

123-kV

DEAD TANK GAS
CIRCUIT BREAKER

3

SINGLE-PHASE POTENTIAL
TRANSFORMERS ADDED



high efficiency. We implemented an array of project controls and change management to help CPAU complete the project successfully.

RESULTS

From design through construction, the project work was completed safely, smoothly and on schedule with our construction partner.

The renewed bay came back online in November 2019. The utility integrated its internal changes with the new installation in a matter of hours, rather than the days that had been assumed.

The substation is now operating at full capacity, benefiting from the safety enhancements incorporated

into our dead tank breaker design. The added circuit breaker will continue to enhance service reliability and enable faster, safer recovery from any future faults.



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