



RIVERSIDE PUBLIC UTILITIES

Board Memorandum

BOARD OF PUBLIC UTILITIES

DATE: SEPTEMBER 25, 2017

ITEM NO: 7

SUBJECT: 4kV TO 12kV CONVERSION PROGRAM STATUS REPORT

ISSUE:

Receive and file this status report on the 4kV to 12kV Conversion Program.

RECOMMENDATION:

That the Board of Public Utilities receive and file the status report on the 4kV to 12kV Conversion Program, upgrading aging 4kV distribution facilities to a modern 12kV distribution system.

BACKGROUND:

The energy delivery system in Riverside was originally designed around a 33kV sub-transmission and 4kV distribution system. Over the years, this standard was revised to a modern 69kV sub-transmission and 12kV distribution system. Riverside Public Utilities (RPU) has gradually migrated to the new voltage standard of 69kV and 12kV over time. These voltage conversion projects are considered routine capital projects and discussion of these were included in the presentation made to the Board at the July 10, 2017.

The Electric System Master Plan recommends the conversion of all aging 4kV distribution facilities to a modern 12kV distribution system to improve circuit reliability, safety, and outage restoration time. 4kV distribution facilities are made up of components that are obsolete, inefficient, and difficult to procure - especially during equipment failures and unexpected outages. The average age of these facilities is 50 years old, and the equipment is at or beyond its useful life. A typical voltage conversion project includes the replacement of all the facilities that make up the distribution system including deteriorated wooden poles, transformers, pole switches, cables and related electrical distribution components.

DISCUSSION:

The purpose of the 4kV to 12kV Conversion Program is to upgrade existing 4kV aging facilities to a 12kV distribution system, which will include the implementation of advanced technology to monitor circuit loads and their impact on the system. Upgrading to a modern, standardized 12kV circuit will result in greater power capacity, reduced line losses, improved electric service and power quality, and improved system operations using standardized equipment.

This modernization effort will help keep up with technology advancements and the increased demand for electricity. 12kV distribution circuits have approximately three times as much power capacity as 4kV circuits. 12kV circuits improve overall system efficiency when compared to 4kV circuits. 12kV circuits also increase voltage stability, which is an important component for photovoltaic installations and large

industrial customers with sensitive equipment. Standardizing on 12kV equipment makes for faster outage restoration since nearby 12kV circuits can be utilized to reroute customer loads while working on equipment to restore power, and components are easier to locate and procure.

4kV to 12kV Conversion Summary

1. 5 Substations are associated with the 4-12kV conversion program (see Project Site Map).
2. 16 Substation transformers will be decommissioned after circuit conversions are completed.
3. 34 4kV circuits will be upgraded to 12kV system.
4. 1 Circuit has been completely upgraded to date.
5. 8 Circuits are currently under construction.
6. 25 Circuits are pending design and construction.

| Substation | Number of substation transformers | Number of 4kV circuits | Number of circuits upgraded | Number of circuits under construction | Circuits under construction projected completion date | Projected completion date |
|----------------------|-----------------------------------|------------------------|-----------------------------|---------------------------------------|---|---------------------------|
| Magnolia Substation | 5 | 5 | 1 | 4 | Oct. 31, 2017 | Oct. 31, 2017 |
| Plaza Substation | 3 | 14 | | 4 | June 30, 2018 | June 30, 2021 |
| Riverside Substation | 4 | 6 | | | | June 30, 2023 |
| Hunter Substation | 2 | 3 | | | | June 30, 2024 |
| Mt. View Substation | 2 | 6 | | | | June 30, 2026 |
| Totals | 16 | 34 | 1 | 8 | | |

4kV to 12kV Conversion Program Status

The next ten (10) circuits to be designed and issued to construction will originate from the Plaza Substation in accordance with the projected schedule:

- a) June 2018 – 5 circuits to be issued to construction with projected construction completion date of June 2019.
- b) Jan 2019 – 5 circuits to be issued to construction with projected construction completion date of June 2021.

The conversion of all 4kV circuits out of Plaza Substation is projected be completed by June 30, 2021. The conversion of the balance of remaining circuits will be complete by 2026.

FISCAL IMPACT:

There is no fiscal impact related to Board action.

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Attachment: 4kV to 12kV Conversion Program Status Report Presentation

Project Site Map

