RIVERSIDE PUBLIC UTILITIES

Board Memorandum

BOARD OF PUBLIC UTILITIES

DATE: SEPTEMBER 14, 2020

ITEM NO: 5

SUBJECT: RIVERSIDE SUBSTATION 15KV RELAY REPLACEMENT PROJECT – WORK ORDER NO. 2021755 FOR A TOTAL CAPITAL EXPENDITURE IN THE AMOUNT OF $900,000

ISSUE:

Consider approval of Work Order No. 2021755 for a total capital expenditure of $900,000 for the Riverside Substation 15kV Relay Replacement Project.

RECOMMENDATION:

That the Board of Public Utilities approve Work Order No. 2021755 in the amount of $900,000 for the Riverside Substation 15kV Relay Replacement Project.
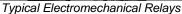
BACKGROUND:

Electrical substations (substations) are the joining of facilities between the distribution and transmission systems. Substations house critical equipment and infrastructures such as substation power transformers, switchgears, power circuit breakers, and protective relaying equipment. All this equipment within the substation boundaries is vital for the electric grid's reliable and optimum operation.

Relays are a critical component of electrical transmission and distribution protection system. Relays are devices that active and trigger the operation of line protecting equipment, including breakers and other switches in substations and related switchgear equipment. Electromechanical relays and control systems were the standards in the electrical industry until the 1980s. Since then, there has been a migration towards microprocessor-based relays and controls. Riverside Public Utilities (RPU) has standardized the use of microprocessor-based relays for all new installations and upgrades. Electromechanical relays are prone to electrical and mechanical failures, require frequent maintenance, and have setting limitations compared to microprocessor-based relays, which perform the same protection operations, but with higher precision and reliability. Replacement of electromechanical relays with microprocessor-based relays is essential to increase safety and system reliability.

Planned system improvements and equipment replacement are prudent and responsible measures to minimize the risk of prolonged power outages due to equipment failures and maximize system reliability.

Typical Electromechanical Relays   *Typical Microprocessor Relays*

DISCUSSION:

RPU has an ongoing program to replace electromechanical relays for the distribution and sub-transmission system. The program targets the replacement of the electromechanical relays based on the relays' age, and system criticality.

The scope of work includes replacing 50 - 15kV electromechanical relays with 15 microprocessor relays at the Riverside Substation. The scope will include replacing existing meters with digital power quality meters, installing a 15kV disconnect cabinet, upgrade the auto-transfer scheme within switchgear 5, and installing a new substation automation system for communication with the new relays.

The engineering design contemplated for this project will be performed by RPU staff. RPU field forces will perform the construction work, testing, and commissioning. The fabrication of the new relay doors will be performed by internal City forces.

The project/fiscal breakdown is as follows:

Project and Fiscal Breakdown		
Work Type	Performed By:	Amount ($)
Project Management and Engineering	RPU Engineering Staff	$165,000
Construction and Testing	RPU Field Forces	$450,000
Equipment and Material		$200,000
Contingency		$85,000
Work Order Total:		**$900,000**
Anticipated Start Date:		**September 2020**
Anticipated Duration:		**10 Months**

FISCAL IMPACT:

The total fiscal impact is $900,000. Sufficient funds are available in Public Utilities Substation Bus Upgrade Account No. 6130100-470616.

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Approved by: Todd M. Corbin, Utilities General Manager
Approved by: Al Zelinka, FAICP, City Manager
Approved as to form: Gary G. Geuss, City Attorney

Certifies availability
of funds: Edward Enriquez, Chief Financial Officer/City Treasurer

Attachments:
   1. Project Site Map
   2. Presentation