



# RIVERSIDE SUBSTATION 15KV RELAY REPLACEMENT PROJECT

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Riverside Public Utilities

Board of Public Utilities  
September 14, 2020

# BACKGROUND

## Protective Relaying Equipment:

1. Critical components in electrical grid system
2. Protect the power grid from abnormal electrical conditions
3. Provide fast isolation of affected circuit sections
4. Ensure proper performance of system reliability, safety and maintenance

# BACKGROUND

Staff has identified protective relaying equipment in RPU's system that have:

1. Exceeded or are approaching end of service life
2. Higher probability of electrical and mechanical failures, and require frequent maintenance
3. Protection settings and communication limitations compared to microprocessor-based relays

# BACKGROUND



**Typical Electromechanical Relays**  
(Aged Units)



**Typical Microprocessor Relays**  
(Replacement Units)

# DISCUSSION

RPU plans to replace 50 electromechanical 15kV distribution electromechanical relays with 15 microprocessor-based relays at Riverside Substation



**Electromechanical Relay**  
(Aged Unit)



**Microprocessor Relay**  
(Replacement Unit)



# DISCUSSION – PROJECT SITE



Riverside Substation 15kV Relay Replacement

W.O. 2021755

SITE MAP



PROJECT  
LOCATION

# DISCUSSION – BENEFITS

New Microprocessor Relays will:

1. Increase system reliability by assuring fast, sensitive and secure operations reducing miss-operation and interrupting fault current effectively
2. Provide intelligent features, flexible protection schemes, and critical information (i.e. fault location, event reports)
3. Reducing maintenance costs and potential equipment failures
4. More reliable operation (self diagnosis)



# DISCUSSION – WORK SCOPE

1. Scope of work includes replacement of relays, upgrades to auxiliary equipment, and addition of new substation automation system
2. RPU staff will perform procurement, engineering design, construction, testing, and commissioning.
3. City's Metal Shop will fabricate new relay doors



# PROJECT AND FISCAL BREAKDOWN

WORK TYPE	PERFORMED BY	AMOUNT (\$)
Project Management and Engineering	Riverside Public Utilities	\$165,00
Construction, Field Testing and Commissioning	Riverside Public Utilities	\$450,000
Equipment and Material		\$200,000
Contingency (10%)		\$85,000
<b>Work Order Total:</b>		<b>\$900,000</b>
<b>Anticipated Construction Start Date:</b>		<b>September 2020</b>
<b>Anticipated Duration:</b>		<b>10 months</b>

# RECOMMENDATION

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