

ROHR SUBSTATION PROTECTION SYSTEM UPGRADE PROJECT

Riverside Public Utilities

Board of Public Utilities
September 13, 2021

RiversidePublicUtilities.com



1

BACKGROUND

Protective Relay Replacement Program

1. Targets the replacement of electromechanical relays with microprocessor relays
2. Replacement is prioritized based on:
 - a. Age of the relays
 - b. Problematic relays
 - c. Availability of replacement parts
 - d. Criticality of the circuits

RiversidePublicUtilities.com



2

BACKGROUND

Protective Relaying Equipment:

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

BACKGROUND



Typical Electromechanical Relays



Typical Microprocessor Relays

Microprocessor Advantages

- 1 - Higher precision
- 2 - Application flexibility
- 3 - Less maintenance
- 4 - Self diagnostic
- 5 - More reliable
- 6 - Improved monitoring and control functions

ROHR SUBSTATION MAP



RiversidePublicUtilities.com



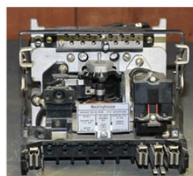
5

DISCUSSION

Primary Task: Replace 34 electromechanical relays with 6 microprocessor-based relays at Rohr Substation.



Electromechanical Relay (Aged Unit)



Microprocessor Relay
(Replacement Unit)



A

RiversidePublicUtilities.com

DISCUSSION – WORK SCOPE

1. Additional tasks
 - a. Replacing analog multifunction meters with digital power quality meters
 - b. Installing a digital substation automation system for communication with the new relays
 - c. Installing new auto-transfer schemes for potential transformers and control power transformers
 - d. Replacing transformer winding and oil temperature gauges
2. RPU staff will perform procurement, engineering design, construction, testing, and commissioning

PROJECT AND FISCAL BREAKDOWN

Work Type	Performed By:	Amount (\$)
Project Management and Engineering	RPU Engineering Staff	\$110,000
Construction	RPU Substation Electricians	\$165,000
Testing and Commissioning	RPU Test and SCADA	\$50,000
Equipment and Material		\$120,000
Contingency		\$40,000
Work Order Total:		\$485,000
Anticipated Start Date:		September 2021
Anticipated Duration:		8 Months

STRATEGIC PLAN ALIGNMENT

This item contributes to Strategic Priority No. 6 Infrastructure, Mobility and Connectivity and the following goals:

Goal 6.2 – Maintain, protect, and improve assets and infrastructure within the City's built environment to ensure and enhance reliability, resiliency, sustainability, and facilitate connectivity.

RiversidePublicUtilities.com



9

STRATEGIC PLAN ALIGNMENT

1. **Community Trust** – Project improves the safety and reliability of the electric system.
2. **Equity** – Supports an equitable distribution of services to ensure every member of the community has access to share in the benefits of community progress.
3. **Fiscal Responsibility** – The project is routine and executed by internal staff more efficiently and effectively due to the integrated understanding of the internal design standards, system configurations and operational practices.
4. **Innovation** – Upgrading electromechanical relays with microprocessor relays (digital) is part of the effort to modernize the grid to make it smarter and more resilient.
5. **Sustainability & Resiliency** – Ensures that new system upgrades provide grid operators the ability to monitor and respond to system disturbances quicker and safer during outages as well as providing the infrastructure that will help the City achieve carbon neutrality by 2040.

RiversidePublicUtilities.com



10

RECOMMENDATION

That the Riverside Public Utilities Board approve the capital expenditure for Work Order No. 2123497 in the amount of \$485,000 which includes all design, construction, procurement, testing and commissioning and construction support for upgrading the protection and automation systems at Rohr Substation.