

Nova/Form 5 Recloser and Control

The innovation is:

The creation of an improved piece of equipment (recloser and control) to monitor and isolate electrical faults on electric utility distribution lines. It can be configured to automatically select an alternate power source to customers should the normal source fail due to a fault. The new design results in lower initial purchase costs, simpler and less costly installation, improved data communication, and lower maintenance costs. The total annual savings is over \$1,000,000, based on an average of 40 reclosers per year.

The recloser and control is innovative for several reasons:

Prior to the new design, reclosers required a separate communication controller. The new design incorporates the communication controller into the recloser control. This results in a cost reduction of 35% in the initial purchase price and eliminates one enclosure from the pole.

The new recloser weighs 245 lb in contrast to 900 lb for its predecessor. It contains no oil while the old recloser contained 45 gallons of oil. This makes it easier to install, eliminates environmental concerns and permits a smaller diameter pole to be used. The new recloser uses an epoxy material for external insulators. The epoxy material is more durable than the porcelain used in its predecessor and is not susceptible to arc damage. The new recloser and control replaces five old designs, simplifying installation and reducing spare-part requirements.

Reclosers and controls are shipped directly to local service centers for direct pickup by the installation crews. This reduces internal handling costs and damage. The maintenance cycle has been increased from 12 to 24 years. This results in a savings of \$80,000 per year.

Changes and replacements include:

- Replacement of five versions of older style reclosers, low technology controls, and external communication controllers.
- Reduced requirements for spare parts. Twenty-one support/maintenance components are no longer required.
- Simplification of handling and installation by linemen. Installation time is reduced by 30%.
- 36% reduction in labor and equipment costs (\$39,000 versus \$26,000).
- Weight approximately 75% less than the previous recloser (240 lb vs 900 lb), allowing for the use of smaller and less costly poles.
- Elimination of the need for an external communication controller.
- Replacement of fragile porcelain insulating components with durable epoxy.
- Elimination of all of the oil (45 gallons) previously required to insulate the old units.
- Seamless integration of the new technology into our existing communication system.
- Maintenance cycle extended to the point where scheduled maintenance is virtually eliminated.

Origination and Use:

The team for this innovation was formed in January 1999. The software architecture was developed by Cooper Power in conjunction with Detroit Edison. Detroit Edison established communication links and specified functional requirements to operate the system. This new innovation went operational on the Detroit Edison system in November 1999. It has been in service and operational since that time. Several utilities have contacted Cooper Power and expressed interest in using this equipment.

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Nova/Form5 Innovation

Old Technology



Top of Pole

46W x 44H x 17D / 45 G Oil

900Lbs



Base of Pole

35H x 16W x 16D



35H x 16W x 16D

Total Installation Cost
\$39,100

New Technology



Top of Pole

40W x 31H x 17D / No Oil

245Lbs



Base of Pole

23H x 19W x 16D

Total Installation Cost
\$26,100

\$13,000

Savings

Significance of weight savings:
Line Crew find it easier and safer to handle lighter recloser on top of pole