

1 **Q. Describe Newfoundland Power's Relay Replacement Strategy. What types of relays**
 2 **are being replaced and where are they located? Describe the types of new relays**
 3 **being installed and how the new relays improve operations and reliability including**
 4 **how they are used with the SCADA system. Provide tables indicating the numbers**
 5 **of new relay installed and the cost for each year since the beginning of the**
 6 **modernization program.**

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 8 A. Newfoundland Power's relay replacement strategy is described in the *Substation Strategic*
 9 *Plan* included as Attachment A in the response to Request for Information PUB-NP-065.

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 11 The new relays being installed are micro-processor controlled, programmable relays.
 12 These modern relays perform multiple protective functions and one programmable relay
 13 can replace multiple older relays. The relays self-diagnostic capability, combined with
 14 other programmable monitoring capacity, will improve the reliability of the protective
 15 relaying systems. The new relays communicate with the SCADA system and provide
 16 additional remote control capabilities to increase operational efficiencies for field staff.
 17 The new relays provide remote access to relay event and disturbance records for
 18 engineering staff to analyse system disturbance data to expedite power restoration.

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 20 Table 1 provides the number of new relays installed and the cost for each year since the
 21 beginning of the modernization program. The Company has not segregated costs
 22 associated with the installation and replacement of protective relays from other protection
 23 and control costs. The annual costs in Table 1 also include cost associated with recloser
 24 control panels, transformer regulator controls, metering and assorted wiring and control
 25 switches located in substation protection panels in addition to the cost for new relay
 26 installation.

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Table 1
New Relay Installations

Year	Total Relays	Annual Cost \$
1998	6	220,774
1999	15	482,022
2000	18	584,236
2001	25	1,193,246
2002	3 ¹	2,020,391
2003	34	2,403,165
2004	29	1,443,104
2005	35	1,130,482
2006	26	4,233,844

¹ Expenditures in 2002 involved the installation of a fibre optic network that supports relay communications and the installation of automated reclosers.

Table 1 (Cont'd)
New Relay Installations

Year	Total Relays	Annual Cost \$
2007	17	762,369
2008	11	902,700
2009	19	2,221,935
2010	26	1,751,532
2011	36	2,545,931
2012	25	2,694,682
2013	27	1,942,861