

1 **Q. Describe Newfoundland Power's relay maintenance program and its relay**
2 **modernization program. How often are electromechanical relays tested? How often**
3 **are electronic and programmable relays tested? Provide copies of any documents**
4 **describing these programs.**

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6 A. Newfoundland Power's relay maintenance program completes a relay operation test on
7 all General Electric Model Type IAC electromechanical relays on a 5 year cycle. This
8 relay operation test is completed using a relay test set to operate the relays comparing the
9 actual relay operation to the manufacturer's specification. Relays found to be outside the
10 manufacturer's specifications are adjusted and retested to ensure they meet the
11 manufacturer's specifications. Relays that cannot be brought into specification are
12 replaced.

13
14 Digital or programmable relays do not require testing on a scheduled basis.
15 Programmable relays include self-diagnostics that generate alarms when a problem with
16 the relay operation is encountered.¹

17
18 Relay modernization started at Newfoundland Power in 1998 with transmission line
19 protection upgrades in the St. John's area. Over a four year period from 1998 to 2001, all
20 short, looped transmission line protection in the St. John's area was upgraded with line
21 current differential relay protection using fibre optic communication. In 2005, relay
22 upgrades commenced on other Company transmission lines.

23
24 In 2001, protection upgrades commenced on the Company's distribution feeders.²
25 Distribution feeder reclosers were upgraded to units with programmable controls to
26 obtain remote control and operational efficiencies. In 2003 the first distribution feeder
27 breaker relays were upgraded to programmable feeder protection relays to provide remote
28 control capability.

29
30 In its 2007 Capital Budget Application the Company introduced its *Substation Strategic*
31 *Plan* that included a strategy for modernization of substation based protective relaying.³
32 In each annual capital budget since the introduction of the strategy the Company has
33 upgraded protective relaying in the *Substation Refurbishment and Modernization*
34 project.⁴ To a lesser extent, protective relays are upgraded in other capital projects. For
35 example modern programmable relays are included with the addition of new transformers
36 under the *Substations Additions Due to Load Growth* capital projects.

¹ Alarms generated by programmable relays are remotely monitored through the Company's SCADA system.

² The 2001 this was included with the *System Control Center – Extend SCADA Capabilities* capital project and referred to as the *Individual Feeder Control* project. The automation of distribution feeders became possible after the installation of the Company's new SCADA system in 1999.

³ The *Substation Strategic Plan* is included as Attachment A in the response to Request for Information PUB-NP-065.

⁴ Copies of the Company's annual update to the Substation Strategic Plan are included in the *Substation Refurbishment and Modernization* report included with its capital budget applications. Copies of these reports can be found as Attachments B through F of the response to Request for Information PUB-NP-065.