

1 **Q. Please provide general descriptions and cycles for preventive maintenance program**
 2 **work in: (a) terminal stations, and (b) distribution substations and identify the**
 3 **Newfoundland Power departments responsible for the design and application of the**
 4 **various preventative maintenance programs.**

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 6 A. Newfoundland Power's preventative maintenance program for work in substations is both
 7 time-based and condition-based.¹ Inspections are completed throughout the year
 8 alternating between short and long inspections.² Substation asset maintenance is
 9 completed on cycles of various duration in accordance with the Company's maintenance
 10 standards and assessment of the current condition and performance of the asset.

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 12 Table 1 describes the inspection and maintenance cycles for substations.

Table 1: Preventative Maintenance Program	
Description:	Cycle:
Substation Inspections	All substations 8 times annually, alternating between <i>long</i> and <i>short</i> inspections
<i>Infrared Inspection</i>	All substations annually
<i>Follow-up Infrared Inspection</i>	All capital projects, hotspot repairs, portable installations
<i>Condition Based Assessment</i>	All breakers (excluding switchgear) and transformers annually
Transformer Maintenance IV	All units over a 12 year cycle
<i>Tap-changer Activity Signature Analysis</i>	All units annually, unless frequency elevated (twice a year if >50 years old)
<i>Transformer Conditional Assessment</i>	All units annually, unless frequency elevated (twice a year if >50 years old)
<i>Transformer Protection Inspection</i>	All units with active protection over a 6 year cycle
<i>Tap-changer Vibration Analysis</i>	All units annually
Breaker Maintenance IV	All units over a 10 year cycle
<i>Bulk Oil Analysis</i>	All oil filled units annually, unless frequency elevated
Portable Substations Maintenance IV	All units annually

¹ Newfoundland Power does not use the term *terminal station* for any of its substations. All Company stations that include transformation and switching equipment for transmission, generation and distribution purposes are referred to as *substations*.

² A long inspection is a detailed inspection that covers all major equipment in the substation and includes a checklist for each piece of equipment that is covered. A short inspection is primarily intended as a means to check equipment integrity (such as oil leaks) and to ensure that no employee or public safety hazards are present in the substation. Examples of short and long inspection forms are provided as Attachment B in response to Information Request PUB-NP-056.

Table 1: Preventative Maintenance Program	
Description:	Cycle:
Battery and Battery Charger Maintenance	All units annually
<i>Battery Capacity Testing</i>	All units over a 3 year cycle
Electromechanical Relay Testing & Maintenance	All units over a 5 year cycle

- 1 The departments responsible for the design and application of the various preventative
- 2 maintenance programs are identified in response to Information Request PUB-NP-057.