

1 **Substations**

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3 **Q. Reference: "2025 Capital Budget Application," Newfoundland Power Inc.,**
 4 **June 28, 2024, sch. B, Northwest Brook Substation Refurbishment and**
 5 **Modernization, p. 55.**

6

7 **Newfoundland Power states "...Install two new 138 kV breakers..."**

8

9 **a) What is the justification for the use of breakers in this case?**

10 **b) Please provide a single-line diagram showing before the upgrades and a**
 11 **single-line diagram after the upgrades.**

12

13 A. a) Two new 138 kV circuit breakers with two side break switches are recommended to
 14 divide Transmission Line 109L into two sections.¹ Installing breakers will improve
 15 automation and reduce substation and transmission outages for customers served by
 16 Northwest Brook ("NWB") Substation.

17

18 Protection of power transformer NWB-T1 consists of a high-speed ground switch
 19 NWB-T1-HGS. The high-speed ground switch relies on L109T4 and L100L109 at
 20 Sunnyside Substation and CLV-109L-B at Clarendville Substation to clear faults on
 21 NWB-T1. The time for a high-speed ground switch to operate and the upstream
 22 circuit breaker to trip is slower than a standard circuit breaker operation. This
 23 exposes equipment to fault currents for longer periods of time, which effectively
 24 reduces the life of the assets exposed to the fault. Replacing high-speed ground
 25 switches with circuit breakers provides standard protection, reduces equipment
 26 exposure to fault currents, and allows the system control center to remotely operate
 27 the transmission lines.²

28

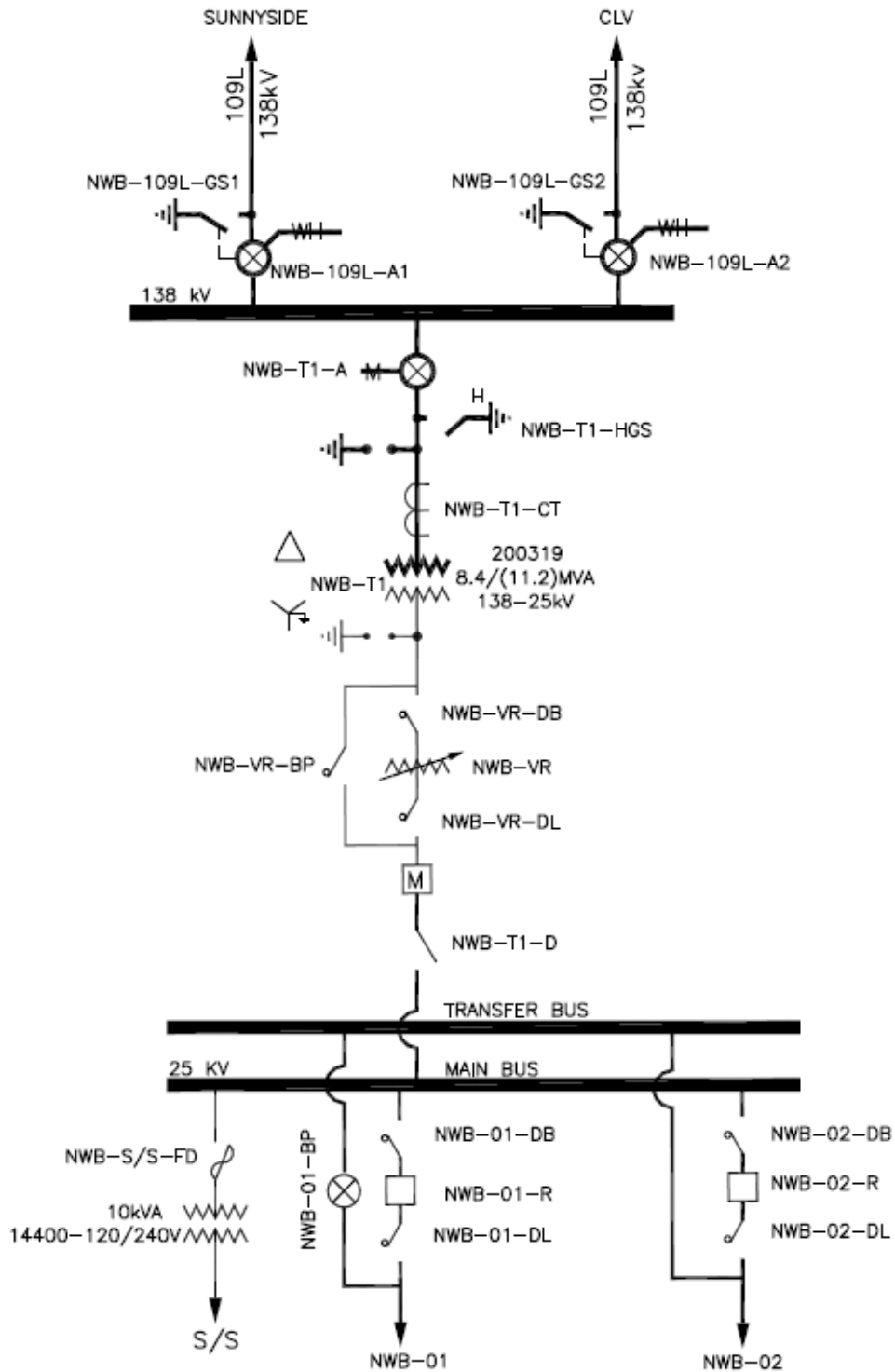
29 b) See Attachment A for single-line diagrams showing before and after the proposed
 30 upgrade.

1 The installation of these two breakers will allow NWB Substation to remain energized in the event of a fault on Transmission Line 109L between Northwest Brook and Sunnyside. It will also allow NWB Substation to remain energized in the event of a fault on Transmission Line 109L between Northwest Brook and Clarendville, including on the Clarendville high-voltage bus.

2 With the circuit breaker additions at NWB Substation, a fault on Transmission Line 109L will no longer cause an outage at the NWB Substation.

ATTACHMENT A:

Northwest Brook Substation Single-Line Diagrams



NORTHWEST BROOK
BEFORE UPGRADES

