

1 **Q. Reference: “2020 Capital Budget Application,” Newfoundland Power, July 5, 2019,**  
2 **Report 3.1 “2020 Transmission Line Rebuild,” sec. 2.3, at p. 3.**  
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4 **The line was also built without armour rods on the conductor at points where they**  
5 **are clamped on insulators. Newfoundland Power’s standard is to use armour rods**  
6 **on conductor at all of the connections that produce mechanical stress on the**  
7 **conductor. Armour rods protect the conductor from conductor fatigue caused by**  
8 **aeolian vibrations. Transmission line 49L was constructed using older vintage**  
9 **porcelain suspension insulators, which have been known to form hairline cracks**  
10 **over time.**

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12 **Please identify the manufacturer of the porcelain insulators, Newfoundland Power’s**  
13 **failure history of these insulators, and reports of any mechanical or electrical testing**  
14 **of these insulators.**

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16 A. The section of 49L proposed to be rebuilt in 2020 was purchased from Newfoundland  
17 and Labrador Hydro (“Hydro”) in 1975.<sup>1</sup> A search of Newfoundland Power’s records  
18 was unable to locate a material list or drawing provided by Hydro at the time of sale that  
19 could identify the manufacturer of the porcelain insulators. However, this section of line  
20 was originally constructed by Hydro in 1966 and Hydro’s *2009 Capital Budget*  
21 *Application* report on Insulator Replacements states that, in the 1960s and 1970s, Hydro  
22 was using Canadian Porcelain (“CP”) and Canadian Ohio Brass (“COB”) pin type and  
23 suspension insulators.

24  
25 It is well documented in the utility industry that porcelain insulators manufactured in the  
26 1960s and 1970s are prone to failure, including those supplied by CP and COB.<sup>2</sup> The  
27 most common mode of failure is caused by cement growth.<sup>3</sup> Given the failure of  
28 porcelain insulators is commonly known, Newfoundland Power has not conducted any  
29 mechanical or electrical testing of porcelain insulators.

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<sup>1</sup> Prior to 1975, when owned by Hydro, transmission line 49L was designated TL221 and provided service to a steel mill near Octagon Pond.

<sup>2</sup> Industry experience with the failure of porcelain insulators is recognized by Hydro in its *2009 Capital Budget Application, Volume II, Tab 8, Insulator Replacements*, page 1.

<sup>3</sup> Cement growth is the expansion of the material which holds in place the pin that supports the connection of the insulator to the pole or to the conductor. Cement growth causes hairline cracks to appear in the porcelain, thereby, weakening the insulator. This leads to electrical and mechanical failure.