

1 Q. **B-29, Install Additional 230 kV Transformer, \$3,535,200**

2 How does the age of the 47 MVA transformers at Hardwoods and Oxen Pond affect
3 the replacement/addition strategy of transformers in the Hardwoods-Oxen Pond
4 loop?

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7 A. The economic life of the power transformers within the Island Interconnected
8 System is 40 years. That is not to say that a transformer must be replaced after 40
9 years of continuous service. The physical life of a power transformer is dependent
10 upon many factors, including, but not limited to, quality of materials used in original
11 manufacture, the safety margins applied in original design, the loading conditions
12 experienced throughout the service life, the service environment, and so on. As
13 part of Hydro's transformer condition assessment approach, the following key areas
14 are assessed to determine a ranking for upgrading or replacement: transformer oil
15 quality which includes Dissolved Gas Analysis (DGA) and Furan Analysis, condition of
16 coolers (radiators), condition of on load tap changer, condition of bushings (leaks,
17 power factor, and PCB contamination), condition of gasket system, and condition of
18 protective devices.

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20 In the context of the Hardwoods – Oxen Pond Loop there are four 40/53.3/66.7
21 MVA power transformers ranging in age from 35 years to 44 years. Given
22 continued favourable condition assessments for these units, the long-term
23 transformer capacity addition strategy for the loop has the four remaining
24 40/53.3/66.7 MVA units replaced due to load growth with 75/100/125 MVA units,
25 bringing the total installed capacity in the loop to 8 x 125MVA or 1000 MVA.
26 Beyond this loading level it is suspected that congestion may limit the number of 66
27 kV transmission lines exiting each of Hardwoods and Oxen Pond. That being the

1 case, new 230/66 kV terminal stations will be necessary to supply the greater St.
2 John's region. Should condition assessment indicate potential issues with a specific
3 40/53.3/66/7 MVA transformer prior to its intended replacement date based upon
4 load growth, an upgrade or replacement will be covered under a future Upgrade
5 Power Transformers capital budget proposal.