

1 Q. **Tab 36; Volume II: Replace MDR 6000 Microwave Radio**

2 Were alternatives (such as leased circuits from a telecom service provider, Hydro  
3 funded fibre builds, or joint-partner funded fibre builds) considered? Please provide  
4 the details of any alternative analyses undertaken along with any associated  
5 cumulative net present value comparisons.

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8 A. Leased circuits were not considered as an alternative as leased lines do not meet  
9 the technical specifications required by Hydro, such as the minimum transmission  
10 delay and availability (reliability). For high speed automatic transmission line  
11 protection, delays at a maximum of 5 milliseconds are required. The existing and  
12 proposed availability design requirement for this application is 99.9999% (loss of  
13 service of 31.6 seconds per year). Service providers cannot guarantee either the  
14 minimum delay or availability, only average values. Failure to provide appropriate  
15 communications for the high speed automatic transmission line protection could  
16 result in disruptions to power delivery on a line and potentially at the grid level.

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18 Hydro presently has a robust, modern and viable microwave communication  
19 system. That system contains such things as steel towers, antennas, buildings, and  
20 radios. To replace it with a fibre based system would involve installing a significant  
21 amount of new additional infrastructure including things like pole lines, redundant  
22 fibre cables, receiving and transmitting equipment as well as other interface  
23 equipment. The total cost to replace the existing microwave infrastructure with  
24 new fibre infrastructure would be significantly higher than the total routine  
25 replacement of microwave components as they near end of life or become  
26 obsolete, such as the MDR 6000 radios. Due to this significantly higher cost, no fibre  
27 based alternatives were considered to replace the MDR 6000 radios.