

1 **Q. Project C-83: Upgrade Digital Fault Recorders - Various Sites**

2 Volume I, Tab C, pages C-83 to C-84, cites Appendix, "Upgrade Digital Fault
3 Recorders" found in Volume III, Tab 29. On pages 6-7 of the Appendix, it notes that
4 the current DFRs are not monitoring some "important information". Elaborate on
5 the information not being monitored and how this translates to the necessity of
6 increasing analog channels, as proposed.

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9 **A.** Hydro authored a report in 2014 that surveyed all stations with digital fault
10 recorders (DFRs). As part of this survey, Hydro completed a review of all analog
11 channels on the existing DFRs and identified stations which would benefit from an
12 increase in the number of analog channels from 32 to 48, as this would provide
13 more information to diagnose a system disturbance event. Appendix B of the
14 report found in Volume III, Tab 29, contains a table for each station containing a
15 listing of all currents and voltages which are being monitored by the DFR, and which
16 are not.

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18 As an example, in the analysis for Hardwoods Terminal Station, found on page B2, it
19 can be seen that the DFR monitors the 3 phase currents on TL201, TL236 and TL242.
20 However, the neutral current on each line is not being monitored in this case. On
21 Transformers T1, T2 and T3, only the neutral current is being monitored, but not
22 the phase currents. The design engineers had to choose which currents and
23 voltages the DFR would record based on the number of analog channels available at
24 the time of install. Adding additional analog channels allows space to add the
25 neutral current on TL201, TL236 and TL242 and to add the phase currents on T1, T2
26 and T3.

1 As another example, in the analysis for Western Avalon Terminal Station, found on
2 page B4, it can be seen that the DFR monitors 4 current inputs (3 phase currents
3 and the neutral current) for TL237, TL201, TL203 and TL217. However, for TL208 to
4 Long Harbour, only the neutral current is being monitored by the DFR. It is
5 recommended to add additional analog channels to add the 3 phase currents for
6 TL208.