

1 Q. Please describe each terminal station transformer defect (since 2000) that resulted
2 in replacing the transformer or replacing major transformer components and list
3 each major issue detected by DGA testing, 6-year testing, or by the failure of the
4 transformer (or tripping of the transformer protection).

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7 A. The table immediately below entitled “Major Transformer Defects: 2000 - Present”
8 lists the terminal station transformer defects since 2000 that resulted in replacing
9 the transformer or replacing major transformer components. The term “defect” is
10 being taken to mean bad condition irrespective of cause. Further below is the table
11 listing each major issue detected by: DGA testing, six-year testing, the failure of the
12 transformer, or tripping of the transformer protection.

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Major Transformer Defects: 2000 - Present

Transformer	Year	Problem	Cause
Corner Brook Frequency Convertor T2	2002	Shorted winding	Weak solid insulation
Wiltondale T1	2008	Shorted winding	Unknown
Sunnyside T1	2014	Bushing failure*	Not determined (investigation by OEM was inconclusive)
Western Avalon T5	2014	Shorted tap changer*	Suspected to be transient overvoltage resulting from a mis-operating breaker (as detailed in PUB-NLH-458 Attachment 1)
Corner Brook Frequency Convertor T2	2014	Winding failure	Failure of winding bracing

* speculated by post-failure third-party investigation conducted by equipment manufacturer

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Major Transformer Issues Detected: 2000 - Present

Transformer	Year	Defect
Corner Brook Frequency Convertor T1	2004	Deteriorated tap changer connection
Massey Drive T1	2006	Deteriorated bushings
Holyrood T8	2007	Worn tap changer components
Massey Drive T3	2007	Worn tap changer components
Holyrood T5	2008	Worn tap changer components
Hardwoods T5	2010	Deteriorated tap changer connection
Come By Chance T1	2011	Deteriorated bushing
Come By Chance T2	2011	Deteriorated bushings
St. Anthony Airport SST-1	2011	Unknown
Hinds Lake T1	2012	Deteriorated bushings
Hinds Lake T2	2012	Deteriorated bushings
Happy Valley T3	2012	Deteriorated tap changer connection
Paradise River T1	2012	Deteriorated tap changer connection
St. Anthony Airport SST-1	2012	Deteriorated bushing
Massey Drive T3	2013	Deteriorated tap changer
Grand Falls Frequency Convertor T2	2014	Deteriorated bushing
Voisey's Bay Nickel T1	2015	Under investigation
Holyrood T5	2015	Deteriorated tap changer