

1 Q. Please file and update as necessary, for the purposes of this Application, the 2008  
2 to 2014 reliability and performance criteria for the Hardwoods Gas Turbine  
3 originally filed in response to Undertaking 81 in the Amended 2013 General Rate  
4 Application, and additionally including the same criteria to the extent available for  
5 2015 and 2016.

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8 A. The following table provides the information originally filed in response to  
9 Undertaking 81 updated to include 2015 and 2016 year to date. The definitions  
10 used in the table are noted below:

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12 • **Failure Rate** is defined as the rate at which the generating unit encounters a  
13 forced outage. It is calculated by dividing the number of transitions from an  
14 Operating state to a forced outage by the total operating time. It can be  
15 greatly influenced by operating time of standby units such as gas turbines.

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17 • **Capability Factor** is defined as unit available time. It is the ratio of the unit's  
18 available time to the total number of unit hours.

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20 • **UFOP** is defined as the Utilization Forced Outage Probability. It is the  
21 probability that a generation unit will not be available when required. It is  
22 used to measure performance of standby units with low operating time such  
23 as gas turbines.

Year	Failure Rate		Capability Factor (%)		UFOP (%)	
	Hardwoods GT	CEA <sup>1</sup>	Hardwoods GT	CEA <sup>1</sup>	Hardwoods GT	CEA <sup>1</sup>
2008	85.11	22.88	91.58	85.68	13.23	40.94
2009	168.25	83.04	85.55	88.12	15.40	36.17
2010	0 <sup>2</sup>	74.10	76.53	89.92	18.67	12.80
2011	228.22	39.81	92.42	80.18	10.20	20.19
2012	255.10	51.13	86.58	86.55	35.14*	20.87
2013	216.34	78.09	69.11*	87.13	15.94	18.22
2014	148.16	85.43	68.68*	72.95	35.09*	12.98
2015	64.06	n/a	62.58	n/a	5.70	n/a
2016 YTD <sup>3</sup>	28.06	n/a	80.14	n/a	0.47	n/a

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In 2010, the capability factor was lower than the previous years due to an extended planned outage from October 25 to December 2. This planned outage included work to replace the engine and upgrades to the unit.

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In 2012, the UFOP was affected by 13 forced outages for various causes. The unit had forced outage duration of 474 hours versus an operating time of 103 hours, including three forced outages during generating mode.

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In 2013, the capability factor was lower than the previous years due to an extended planned outage from October 4 to December 17. This planned outage included work to replace the alternator, control cables, a fuel valve on End A, upgrades to the generator protection, replacement of the building cladding and other general corrective maintenance.

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<sup>1</sup> CEA Data for 0-10% Operating Factor Classification - All Canada Combustion Turbine Units (GTs)

<sup>2</sup> In 2010, there were no instances when a forced outage occurred when generating. The unit would have times when it was not available due to a forced outage if, for example, the forced outage occurred as a result of an issue discovered when it was not operating.

<sup>3</sup> 2016 YTD includes data up to April 30, 2016.

1 In 2014, the capability factor and UFOP were both affected by two forced outages.  
2 One forced outage occurred from July 25 to September 25 due to a fire in the motor  
3 control centre (MCC). The other was from November 27 to December 7 due to a  
4 fuel supply failure.

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6 In 2015, the capability factor was affected by a forced outage of Hardwoods End B  
7 beginning on March 1. The outage was due to a failed component on a fuel oil vent  
8 line. This failure resulted in a fire about which an inspection revealed internal  
9 damage to the Hardwoods End B engine. Following this inspection, it was  
10 determined that the engine would have to be refurbished at an offsite facility.  
11 Engine refurbishment was completed and the unit was reinstalled in November  
12 2015.

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14 On February 8, 2016 Hardwoods End A engine experienced an outage due to a  
15 combustion can failure and was taken out of service. A leased unit was installed to  
16 return the Hardwoods GT to 38 MW until approval can be acquired to refurbish and  
17 reinstall the failed engine.