

1 Q. **References: Tab 4; Volume II: Overhaul Olympus Gas Generator – Stephenville**  
2 Hydro states on page 3, lines 10-11, *“The service life of the engine overhauls, which*  
3 *utilize refurbished parts, is five years.”*

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5 Are there other metrics used to determine the service life of refurbished engines  
6 other than simple time (e.g., operating hours, number of equivalent starts, etc.)? If  
7 so, how does the Stephenville gas turbine’s service life fare based on those metrics?

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10 A. The metrics typically used to determine the service life of refurbished Olympus C  
11 gas turbines are those prescribed by Rolls Royce, the original equipment  
12 manufacturer. They include:

- 13 • Operating Hours – 30,000 hours;
- 14 • Operating Cycles<sup>1</sup> – 2250 cycles due to the Stage 5 life limiting spacer; and,
- 15 • Condition as determined by gas turbine performance and/or inspection.

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17 In Hydro’s experience, the service life of a refurbished Olympus C gas turbine is  
18 primarily determined based on the condition of the gas turbine through the  
19 completion of semi-annual inspections and the ongoing review of its operating  
20 performance. Hydro’s refurbished Olympus C gas turbines have not historically met  
21 either of the hours or cycles operating metrics noted above to trigger a  
22 refurbishment.

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<sup>1</sup> A cycle is defined as an engine speed excursion from 0 rpm to full speed and back to 0 rpm.

1           Given the units' current operating regime, the operating cycles metric is forecast to  
2           be typically met in 5 to 7 years. Therefore, on a forecast basis, Hydro plans to  
3           complete this work on a five-year cycle.

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5           Stephenville Engine End B (Serial No. 202223) does not meet the operating hours or  
6           cycles criteria for refurbishment; however, recent inspections have identified issues  
7           with its high-pressure turbine guide vanes and blades, which need to be addressed  
8           after the 2018-2019 operating season.