FACILITY DESCRIPTION

The proposed Oakville Generating Station ("OGS") is a natural gas-fuelled combined cycle power generating station nominally capable of generating a net electrical output of 945 MW of electricity at average conditions. The expected output of the proposed OGS at average ambient temperature is 945 MW derived from two 275 MW (nameplate) Mitsubishi M501GAC combustion turbine generator (GT/G) sets and one 425 MW steam turbine generator (ST/G), at average ambient environmental conditions minus the auxiliary loads (approximately 30 MW) used by the proposed OGS. Specifically, the proposed OGS will consist of the following key pieces of equipment. All equipment outputs other than those labelled nameplate are listed at average ambient environmental conditions of 7.5°C and 63% relative humidity. The key pieces of equipment are as follow:

- Two (2) Mitsubishi M501GAC industrial gas turbine generator (GT/Gs) sets with a nominal average ambient output of 275 MW each, using natural gas as the only fuel. The gas turbines have an expected nominal natural gas firing rate of 73,911 m^3/hr or approximately 2793 GJ/hr (high heating value, HHV) per turbine. The gas turbines are also equipped with evaporative coolers to chill the inlet air in the summer and compressor air bleed inlet heating systems to ensure the turbines are not damaged in the winter. During inlet heating conditions air will be taken from the compressor section and mixed with cold air upstream of the compressor inlet. Air will pass through the inlet air filter and cooling system prior to entering the compressor section. The air will then mix with entering gas and will undergo a combustion process; the resulting expansion produces mechanical work on turbine blades, which spin the turbine and generator rotor producing power in the generator.
- Two (2) horizontal heat recovery steam generators (HRSGs) in multiple-pressure configuration which generate steam to feed the ST/G. Each HRSG produces a nominal 614,200 kg/hr of steam without duct firing and 999,700 kg/hr with maximum duct firing.
- Two (2) low NOx duct burners, one (1) in each HRSG. Each duct burner has a maximum natural gas firing rate of 19,466 m^3/hr or 735.6 GJ/hr (HHV). The total maximum exhaust flow rate through each HRSG stack (including that of the gas turbine and assuming duct burners are at 100%) is about 1354.4 m^3/hr. Each HRSG stack has an inner diameter of about 6 m and extends 63 m above grade.
- One three casing arrangement, three pressure, single reheat double flow ST/G rated nominally at 425 MW at average conditions.
- A Selective Catalytic Reduction (SCR) system will be installed to reduce the NO_x emissions from the exhaust streams of each gas GT/G, including the duct burner exhaust. The SCR will reduce NO_x emissions to 3.5 ppm leaving each exhaust

stack at average ambient conditions. Each GT/G exhaust gas will pass through the duct burner grid the inlet duct of the SCR section of its HRSG where ammonia is injected as supplied from the ammonia injection skid. Ammonia is added upstream of the SCR catalyst to effect further reduction of any NO_x in the exhaust stream which passes through the SCR catalyst grid before discharging to the rest of the HRSG and eventually exiting the HRSG through the exhaust stack. On-site ammonia storage (19% aqueous ammonia) and associated ammonia injection skids at each SCR will be provided to support this NO_x reduction.

- A single, two (2) row, back to back, multi-fan, field erected mechanical draft, evaporative cooling tower (CTW). The tower consists of a bank of 16 cells, one (1) fan per cell and is expected to operate at eight (8) cycles of concentration and will provide the cooling required to condense steam from the exhaust of the steam turbine.
- Other auxiliaries, including those providing compressed air supply, electric power supply and distribution, natural gas filtering, compression and heating, and water treatment and purification, and wastewater collection and processing, will exist on-site to support operations of the two GT/Gs, the two (2) HRSG's and the ST/G. Water treatment will occur within a water treatment building on-site. Primary control of the proposed OGS will occur from a main control room located in the Service and Administration Building on-site.
- A total of one (1) natural gas fuelled auxiliary boiler equipped with low NO_x burners with a nominal rating of 65,000 kg/hr of steam at a heat input of 190 GJ/hr (HHV), or 5030 m^3/hr of natural gas, exhausting to the atmosphere through a stack at a rate of 18 m^3/s and a temperature of 323°C having an exit diameter of 1.55 m and extending 15 m above grade.
- One (1) emergency stand-by diesel generator rated at 2 MW (heat input 20 GJ/hr (HHV), firing diesel fuel at a maximum rate of 465 L/hr and exhausting at a maximum flow rate of 8.5 m^3/s, through a stack of 0.137 m in diameter and extending 34 m above grade. It will be tested for approximately 1 hour per week during normal operation of the proposed OGS which results in operation of less than 60 hours per year. This generator will provide power to critical auxiliaries during times when power supply via the Ontario grid is not available.
- Natural gas-fuelled roof-mounted comfort heaters for the main building with a total capacity of 19 GJ/hr.
- One (1) 100% capacity electric, screw type, approximately 3 MW natural gas compressor boosting the natural gas pressure by approximately 150 psi.
- One (1) gas insulated switchyard.
- One (1) 400 kw diesel fire pump as part of the fire protection system.

Figure 1 defines the combined cycle process schematically, and displays the components and their interaction for the proposed OGS. Note that this diagram does not display station auxiliaries.

Figure 1 – Process Diagram for the Proposed OGS