

## **Dover Generation Operating Specifics**

Each of the four generators in Dover has unique features and operating characteristics. However, units 1 and 2 are so similar that they will not be separately discussed. Therefore, three different operating parameters will be discussed.

Units 1 and 2 are relatively small but take a considerable amount of effort to startup and make ready for dispatch. For this reason, and due to their age, they currently have the longest minimum run time of all the units---a minimum run of 24 hours. A cold startup of these units takes approximately 12 hours; a hot start takes 7 hours. During startup, each unit can use between 500 and 1000 MCF of gas, prior to synchronization. When on line, each can be cycled from a low load of approximately 5 MW to a maximum of 17 MW. It takes approximately 15 minutes to go from minimum to maximum or vice versa. These units typically operate between a minimum load of 6 MW net and a maximum economic load of 15 MW net. They demonstrate a capacity of 17 MW net every summer and winter. On gas, these units burn approximately 200 MCF per hour at full load; on oil, each unit burns approximately 1500 gallons per hour at full load.

Unit 3 is the lowest cost unit and the largest MW producer. This unit takes about 12 hours to startup when cold and 6 hours when hot. On line, it takes about 55 minutes to go from a low load of 35 MW net to a full load of 102 MW. This unit typically operates between a minimum load of 35 MW net and a maximum economic load of 93 MW net. It demonstrates 102 MW net every summer and winter.

Unit 11, the VanSant station, has the quickest startup time and the highest operating costs. This is a GE Frame 6B combustion turbine that can be placed on line within about 20 minutes, if someone is standing by to do so. It takes approximately 10 minutes for a person to go to the VanSant station to prepare for the start up. Due to the sensitivity of load to inlet air temperature, the normal full load output of this unit varies from a low 35 MW in the hottest part of the summer to a high of more than 45 MW in the cold of the winter. Fuel consumption at full load is approximately 450 MCF per hour when on gas or 3500 gallons per hour when on distillate oil. Load can be varied from base load by dropping load slightly, down to approximately 5 –10 MW. However, due to the nature of gas turbine operations, there is not a significant fuel savings when shedding load; it is most economical to run while at “base” (full) load. This unit typically operates at full load and is rated for capacity purposes at 39 MW net in the summer and 40 MW net in the winter.

## **Fuel Specifics**

Natural gas is delivered to the McKee Run via underground pipeline. The gas arrives at McKee at approximately 500 PSIG and is reduced to 50 by on site reducing stations. Natural gas is used as both igniter fuel for startups, and as back up fuel for all four units.

Residual oil (#6) is stored at McKee Run in a 2.5 million gallon storage tank. In feet, this tank holds about 24 feet. When the level reaches 4 ft, we begin to get worried that our fuel pumps will lose suction. Units 1, 2, and 3 all use this tank as the source of their primary fuel. With all

three units at full load we can use 8500 gallons of oil (about 1 ¼ inches in the tank) per hour. This oil is delivered on site via truck at approximately 6000 gallons per truck. Three to four trucks can be unloaded at a time; it takes about 30 minutes to unload a truck.

Natural gas is also delivered to VanSant station via underground pipeline. The gas arrives at VanSant at approximately 320 PSIG and the station does not have gas compressors. Distillate oil (#2) is stored at the VanSant station in a 260,000 - gallon tank to provide primary fuel for the combustion turbine. When full this tank measures 32 feet. Fuel is delivered via truck at approximately 6000 gallons per truck. At full load, the gas turbine will use 3500 gallons per hour, or approximately 5 ½ inches in the tank.

Each of the four Dover units can run entirely on its primary fuel, entirely on its backup fuel, or on any combination of both fuels. All four can switch between fuels without shutting down.