

McNeil Station is currently economically dispatched by NEPOOL on a least energy cost basis. As a result, McNeil Station cycles according to alternative fuel pricing, competitive unit availability, and New England energy demands. McNeil has cycled as often as 210 times annually. The unpredictability of dispatch greatly complicates fuel procurement.

In 1990, the City of Burlington established a waste wood recycling facility at McNeil Station. Residents of Burlington brought their tree trimmings and leaves to the station instead of to the landfill. Approximately 1300 t of leaves are composted and spread on farmlands. Approximately 3000 t of waste wood were processed annually and added to the McNeil fuel supply. In 1993 the recycling facility was made available to members of the Chittenden County Solid Waste District, which increased the waste wood supply to 5,000 t/yr. During 1998, approximately 20,000 t of fuel were received from the waste wood recycling facility. The increased capacity was because of a major ice storm in January 1998.

In 1989, the ability to burn natural gas was added to McNeil Station. Summer pricing for Canadian gas was at one time more attractive than wood prices. Having an additional fuel somewhat simplified the fuel procurement/consumption variations. Six fossil fuel burners were installed allowing full load capability on gas and 15 MW capability on No. 2 oil. When gas burners were first installed the state NO_x emission limits could not be met. A flue gas recirculation system was added which reduced the NO_x emissions from 0.32 lb/MBtu to 0.1 lb/MBtu, well below the standard of 0.13 lb/MBtu.

The annual wood consumption has varied from a maximum of 460,000 t in 1985 to a minimum of 125,000 t in 1986. After full load capability on natural gas became possible in 1990, about two-thirds of the fuel requirements were met by wood and one-third by gas until gas prices rose during the mid-1990s. During 1997 and 1998, the McNeil Station burned almost no natural gas, and burned about 260,000 t/yr of wood (assuming 50% moisture).

Operating Experience

Following the initial startup, most O&M challenges resulted from the cycling operation of the plant and uncertainty of fuel requirements. Lower dispatch than anticipated caused wood inventory to grow to more than 100,000 t in 1985. Some of the wood on site was more than a year old and was badly deteriorated. The smell from the wood was objectionable to neighbors. The older wood became very acidic, which caused steel components in the wood handling system to wear faster than anticipated.

A misalignment of the boiler grates during erection caused high maintenance in that area. The almost daily cycling of the unit resulted in higher maintenance in the ESP when carbon-rich ash on the collecting plates would burn when exposed to fresh air after shutdown. Despite these difficulties, the station has maintained an average availability of more than 90.9% since June 1984.

Environmental Performance

The air quality permit for the McNeil Station limited the particulate emissions from the stack when burning wood to 0.007 gr/dscf of flue gas corrected to 12% CO₂. This was far more stringent than any solid fueled source licensed at the time. To meet these requirements, GEESI supplied and erected 50-in. diameter mechanical cyclone collectors