



MONTANA-DAKOTA UTILITIES CO.
ADVOCACY STAFF – MARC, LLC
DATA REQUEST DATED AUGUST 23, 2010
CASE NO. PU-10-124

NDPSC-DR-045 **What impact does minimum generation have on coal generation facilities in terms of longevity of plant?**

Response:

Operating a coal-fired generating facility at sustained minimum generation levels can increase the potential for corrosion of steel components within the air heater and back pass equipment. This happens when the temperature falls below the dew point of the flue gas. The moisture will combine with sulfur dioxide and sulfur trioxide in the flue gas to form sulfuric acid which will damage the steel components. Within the Montana-Dakota fleet of generation facilities this is mitigated by limiting how far a unit is turned down and by the use of pre-heaters to warm the combustion air prior to the air heater. Operating at sustained minimum generation levels can also increase the water particle erosion to blades in the later stages of a steam turbine by shifting the point at which steam condenses into water droplets.

The greatest adverse impact to the longevity of a coal-fired generating facility is caused by cycling operations. Cycling operations include startup/shutdowns, on-line changes in generation levels, and high frequency generation level changes under automatic generation control. Thermal stresses caused by the accumulation of these cycling operations can lead to damage due to fatigue and result in increased maintenance costs and replacement of major components. The generation facilities within the Montana-Dakota fleet are less impacted by cycling operations because they are of an older vintage and more robust design, and have not been subjected to frequent startup/shutdowns.