

Midlothian Air Cooled Condenser Fogging System



Midlothian Plant Facility

- CCGT / 1500 MW's / Located near Dallas Texas
- 6 Units / Alstom GT24 / 1 on 1 Configuration
- 6 Balcke Durr ACC's / 15 Fans per Unit / 90 Fans Total



— ACC Fogging System Performance (History)



Wind velocity & direction have effected ACC performance during hot ambient conditions. Wind screen placement has improved ACC performance.

— ACC Fogging System Performance (R&D)



Install ACC inlet air fogging system to gain additional MW's during peak market opportunities.

— ACC Fogging System Performance (Expected)

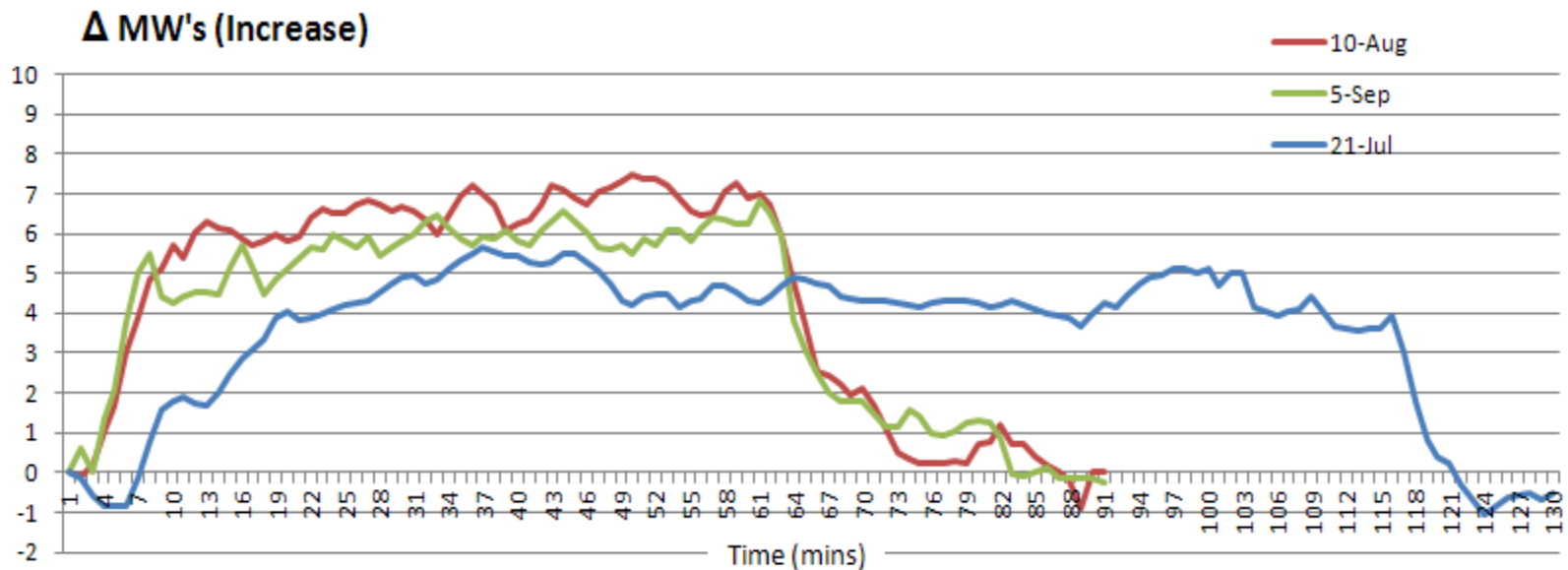


Expected unit performance is 10 MW net increase at 105⁰F ambient temperature with a 25⁰F ACC inlet air temperature drop operating 40 hours per year.

Performance Testing Program

➤ Test Program Results

- Ambient temperatures during these tests were 103°F, 97°F, and 98°F for Jul 21st, Aug 10th, and Sept 5th, respectively.
- Average wind velocities were 7, 19, and 16 mph for the same test periods.



Performance Testing Program

➤ System Performance Observations

- The system increased the unit's generation output by approximately 5.5 MW's after 10 minutes of operation.
- After 30 minutes of system operation, with ACC temperatures stabilized, the system increased the unit's generation output by 6.5 – 7.0 MW's.
- Improvement of the Steam Turbine Backpressure of 3.5 psia on average
- Additional benefits : Improvement of the Unit Heat Rate of 180 Btu/KW on average
- Test of the Unit at maximum system design conditions @ 105⁰F have not been available for testing

Performance Testing Program

- Recommended Next Steps to Mitigate Wind Influence for Fogging System Performance Improvement
 - Continue revising the wind screen configuration to increase system performance.
 - This is the least cost option, \$15K. Additional screens are on order and are planned to be installed in the next couple of weeks.
 - Consider increasing the ACC fan blade pitch to the maximum OEM recommended setting to increase cooling air flow.
 - The plan is to adjust the pitch on the perimeter fans on the south and west sides where the majority of the wind velocity effect is observed . Plant staff would be used for this but it needs to be performed during a Unit outage.
 - Consider relocation of several of the atomizing nozzle lines to help optimize fogging.
 - This option needs to be engineered and planned. Cost estimate would be \$25 - \$75K for this effort. (Currently no funding available for this effort)

Midlothian Air Cooled Condenser Fogging System Performance

