

Specialist testing supports challenge to guarantee

Snapshot

Client

Energy recovery plant, UK

Challenge

Measure air flows to an air cooled condenser (ACC) and evaluate the impact on overall power output of the energy recovery plant.

Solution

We carried out air flow testing, measured ambient conditions and temperature rise across the ACC. We used plant operational data to conduct a steam turbine analysis to compare actual ACC performance with design values.

Benefits

We showed that air flow to the ACC was almost 60% below the design value, having a significant impact on steam turbine power output during summer months. Our client used the data to challenge operational performance guarantees.

When our client needed an independent opinion on the ACC of its recently commissioned energy recovery plant, we used our experience in testing similar equipment to provide reliable data which was then evaluated to demonstrate a performance shortfall.

Specialist instruments

We used calibrated test instruments in accordance with test codes to measure the air flow to each ACC fan. Additional instruments were fitted to measure ambient conditions – temperature, pressure, humidity, and wind speed and direction – and temperature rise across the ACC.

Using data from the plant's control room, we conducted a steam turbine analysis to determine the approximate steam flow to the ACC. We then plotted the actual ACC performance and compared this with design values revealing a performance shortfall.

Impact on power output

We advised our client that air flow to the ACC was almost 60% below the design value, which would potentially reduce maximum power output from the steam turbine, particularly during periods of high ambient temperature. Our client confirmed that operational problems had led to reduced power output during summertime operation.

Data from our tests was valuable for our client to use in challenging operational performance guarantees.

Had we been asked to witness the initial acceptance testing of the plant, we would have requested the OEM conduct a similar test and the shortfall in ACC air flow would have been identified earlier during plant commissioning.

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