OHROS Consulting Group
Coal Transition Support

COMPANY

A leading power supplier in Canada that has been around for nearly a century, with a capacity of powering up to 350.000 households, provincial industry and neighboring provinces.

CHALLENGE

Imposed regulatory coal power plant closure dates, increasing carbon taxes and an exponential growth of the intermitted renewable energy across the company portfolio, necessitated an assessment at a 2-unit 600MW (2x200MW) coal fired power station to support the transition to end-of-life. Aligned with energy transition strategies, this assessment focused on reviewing plant design, condition, and operational status to deliver improved load turndown, load following, and ramp rate operation and thereby increase overall Operational Flexibility.

APPROACH

Phase 1

Plant Assessment

Operational Flexibility Assessment, using our typical 3X3 approach, aiming through plant design, condition and operational status review, to identify key issues and associated challenges that could compromise performance objectives.

Phase 2

Computational Fluid Dynamics Modelling

Performing an engineering analysis of combustion performance to support the wider flexible operation transition project using Greenbanks Computational Fluid Dynamics (CFD), with associated chemical-kinetics analysis and engineering evaluation.

Phase 3

Plant Test Trials

Develop a test program through a Combustion Performance Working Group and conduct test trials to verify the model's hypothesis on:

- FlexOps procedures
- Load Turndown
- Ramp Rate performance
- Combustion stability

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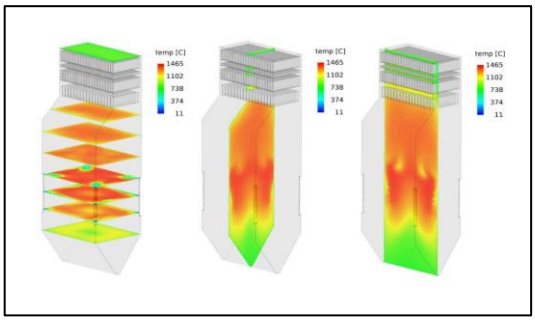
Objectives

The project aimed to enhance operational flexibility at the power station to facilitate growth of renewable energy deployment and reduced emissions whilst maintaining operational safety and integrity. This was to be established through a new load turndown reference point and improving ramp rate operation. Through plant assessment and combustion trials, the objective was to achieve a load turndown improvement of approximately 25% to 50% load and increase the ramp rate by 100%. Maintaining operational safety and integrity was paramount, in the context of ongoing performance management. These objectives were supported through combustion CFD Modeling (by Greenbank UK Ltd.), and encompassed a thorough safety review prior to the start of the test program.



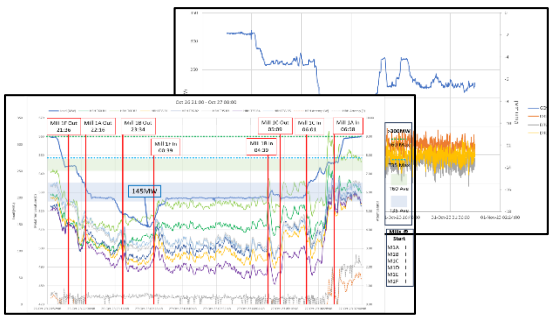
Results

Results from the program demonstrated promising outcomes. Load turndown trials revealed the capability to reduce load to 55% with no significant issues encountered, albeit slightly above the initial 50% target due to technical constraints. Similarly, ramp rate trials demonstrated a significant improvement in operational performance albeit a little lower than the target rate. Comprehensive data analysis highlighted areas for improvement, particularly in thermocouple coverage, instrumentation feedback and overall plant integrity management. Recommendations were provided to enhance operational safety and reliability, with strong emphasis on addressing these areas during the next outage. Associated outage guidance was provided.

Overall, the project showcased the Unit's potential for improved operational flexibility and significant savings in oil consumption without requiring substantial investment costs.

Ramp rate improvement
150%

Turndown Improvement
23% to 55% load



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