

ONLINE ANALYZER SURVEILLANCE & OPTIMIZATION

COAL QUALITY SERVICES

At many blending and sorting installations the benefits expected from the introduction of real-time on-line analysis have not been realized in practice. This can usually be corrected by careful surveillance and optimization of the total measurement system, i.e., all equipment and procedures used in the measurement process, including the analyzer, the coal sampling system, the laboratory and associated procedures.

SGS provides the independent technical expertise necessary to identify and correct problems and optimize the performance of on-line analyzer systems.



PROGRAM SERVICES

PHYSICAL INSPECTION

A qualified SGS inspector performs an annual on-site inspection of the analyzer and associated coal sampling system. After the inspection, a report is provided detailing any deficiencies and offering recommendations for enhancements and improvements to systems and procedures.

CONTINUOUS SURVEILLANCE

Each time updated laboratory and coal analyzer data (one or more data sets) is received by SGS Minerals Services, selected statistical routines are applied to detect potential analyzer and coal sampling/sample assay problems. These detection routines employ optimal statistical procedures using baselines established from previous analyzer performance tests and other historical information related to the specific installation.

TROUBLESHOOTING

A positive detection by the statistical analysis may be caused by the need to calibrate the analyzer, or a fault (mechanical, electrical or procedural) with the analyzer, or the sample collection and laboratory analysis. When a problem is indicated, an investigation is initiated. The investigation includes one or more of the following:

- Confirmation of the accuracy of the analyzer data using remote querying of the database in the analyzer computer.
 - Confirmation of the accuracy of the assay data by communicating with the reporting laboratory.
 - Review of the sampling ratio charts of the coal sampling system.
 - Confirmation of the sampling system operating parameters.
 - Determine if the reported laboratory values for the problem data set are consistent with previous data (examine MAF BTU, moisture, ash and sulfur trends, etc.).
- Determine what specific analyzer base measurement (silicon, aluminum, sulfur, etc.), may have triggered the positive detection.
 - Consult with the analyzer manufacturer's field representative on possibilities such as density source movement, etc.
 - Arrange for immediate reporting and statistical analysis of data sets observed subsequent to detection of the potential problem. There is a small but finite chance that the statistics will indicate a potential problem when no problem exists. If the problem is real, subsequent data will confirm the reality.

CORRECTIVE ACTION

When the source of the problem is identified, SGS works with the responsible parties to remedy the problem. For example, if the coal-sampling ratio indicates an out-of-control condition, the problem will be investigated and a solution found by working with those who operate and maintain the sampling system. Analyzer problems will be resolved by working with the analyzer manufacturer or the party in charge of analyzer maintenance.

ANALYZER CALIBRATION

SGS staff includes personnel with world-recognized expertise in calibration and performance testing of on-line coal analyzers [1,2]. The methodology developed and used by SGS is unique in that it enables an unbiased calibration by taking measurement error into account. Unbiased estimates of analyzer measurement precision are obtained by using mathematics not requiring the assumption of perfect calibration of the analyzer during the test period. When a special test is required for formal recalibration or precision testing of the analyzer, SGS will prepare detailed test specifications, do the statistical analysis of the data and provide a report with results and recommendations.

THE RESULTS

Surveillance and optimization of your on-line analyzer results in several benefits:

- optimal performance of the system
- realization of the advantages that real-time on-line analysis provide
- generation of the return-on-investment originally anticipated when acquiring the system
- assurance that on-going surveillance will identify any new problems before they create a significant negative impact on operations

REFERENCES

Rose, C. D., "Methods For Assessing the Accuracy of On-line Coal Analyzers," J. Coal Quality, Vol. 10, No. 1, 1991, pp. 19-28.

Rose, C. D., "Calibration and Performance Testing of On-line Coal Analyzers," submitted in July 2003 to ASTM Journal International (JAI) for publication.

CONTACT INFORMATION

Email us at minerals@sgs.com
www.sgs.com/coal

