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Effectively Harnessing Emissions Compliance Data

Regulatory mandates for the stringent control of air quality, including greenhouse gas emissions, are being increasingly tightened. Agencies at the federal, state and local levels are requiring more data collected by direct measurement from continuous emissions monitoring system (CEMS) equipment instead of relying on factors to calculate emissions based on other process measurements. These directives require much more stringent auditability requirements and transparency of emission calculations.

To complement this request for comprehensive data are technology advances that continue to provide instruments with the measurement capability to collect larger, more massive datasets. As plants expand through retrofit, air emissions information from additional process units needs to be integrated into existing compliance systems, further increasing the volume of data collected. Once analyzed, the data forms the basis for plant-wide emissions reporting and compliance monitoring.

Coupled with this increased data volume is the enhanced complexity of the required calculations used within the regulations. The recent EPA Greenhouse Gas Reporting Rule, for example, is unprecedented in its specificity of exactly how carbon emissions must be calculated from each source. In addition to the greater complexity is a staggering number of calculations. It's estimated that a large refinery might require as many as 7 million calculations daily, and even a small facility might approach 1 million daily calculations. These increasingly sophisticated formulas that need to be implemented in compliance solutions require more manpower and knowledge to accumulate and verify the quality of the data before it's reported.

In many facilities, the calculations used for reporting are based on data collected from various groups, both operations and environmental. It then becomes likely that multiple, diverse data sources will be used for different reports that contain subsets of common information. Inconsistencies in current reports cause loss of confidence by the regulatory agencies and by the public because these reports are increasingly released directly by the agencies via web pages, and processed by third parties through increasingly sophisticated statistical verification algorithms.

Timeliness in notifying regulators that an uncontrolled release has occurred is also critical. Data that can't be processed in time to meet short-term emission reporting has to be estimated, with assumptions being made until data can be fully processed. This can be extremely problematic if there are plant upsets that require an immediate explanation of why the event occurred and the actions taken to bring the facility back into compliance. Real-time information processing provides the ability to lower reporting lag and eliminates the need to significantly adjust initial estimates. Since the information is available to immediately generate the report, the environmental staff can spend more time reacting to situations instead of poring over manual calculations.

The ultimate goal of air emissions data

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collection is to generate accurate and consistent environmental reports as part of a larger enterprise information management strategy. Plant management is often reassured that reports backed up by larger amounts of data are complete and accurate.

A potential problem with this approach is that volume of information does not always equate with high accuracy. Mountains of data do not necessarily lead to better results. In fact, it can often hide discrepancies or mask problems in the calculations. The results, while appearing to be complete, can't be verified by third parties. Organizations might not consider the ramifications of fines from regulating agencies when underlying data used in reporting can't be located, crumbles under scrutiny or is found to be based on non-verifiable assumptions. Discoveries of inconsistent results from reported information can lead to a loss of confidence from all stakeholders—management, shareholders, the public and regulators.

How can this problem be solved? The solution is for plant facilities to increase their focus on the accuracy and completeness of the underlying data rather than simply on the volume of information collected. As corporate enterprise information strategies evolve, they need to extend their focus beyond business and accounting processes to also encompass their facility's environmental data management systems.

Those systems, in turn, need to be consistent in their calculations with a clear indication of how those computations are performed. They need to seamlessly integrate into existing business information systems so the same information is distributed through sustainability reports to shareholders, KPIs to the board of directors and notifications to operations. The wider visibility of high-profile environmental information increases the importance of ensuring that all groups use the same source of data.

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To build stakeholder confidence, the systems' primary objective needs to be creation of timely, accurate, retrievable and consistent emissions information. An effective implementation will increase the efficiency of the entire reporting process. A properly designed and implemented system saves facilities money, increases public confidence, generates good will and increases compliance with the regulations themselves, ultimately reducing environmental violations and fines. ■