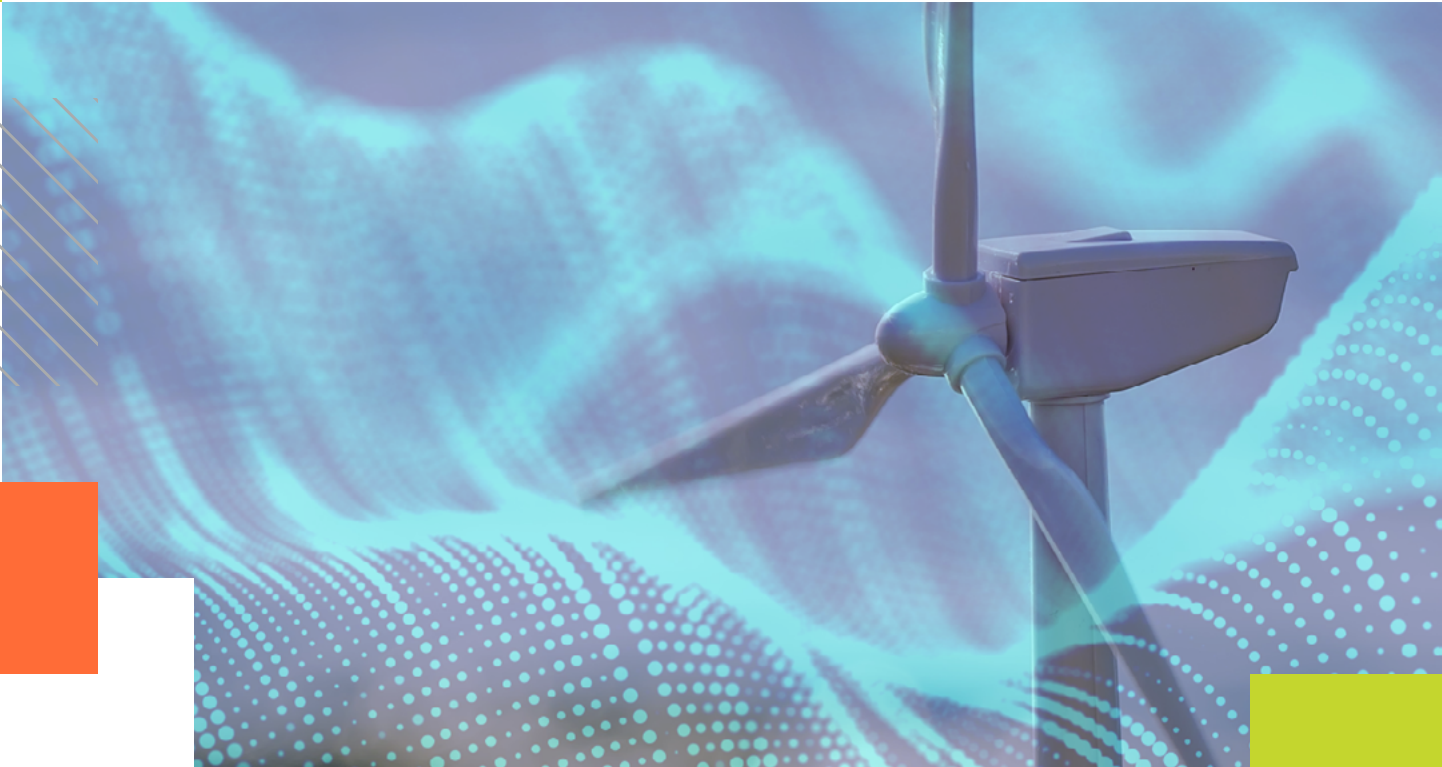



CASE STUDY / **IMPROVING OPERATIONAL AWARENESS AND REPORTING**

Operational data gaps resolved with an OSIsoft PI software solution

A Midwest-based independent power producer and supplier was seeing discrepancies between energy output of wind turbines and the energy available to be sold to customers. To effectively track and build awareness of outages at the corporate level and improve communications with consumers, a new software solution was implemented that created operational efficiencies across the board.





An integrative software solution allows for field staff to better track and respond to wind turbine outages, to efficiently produce and sell energy to customers.

Project stats

Client

Confidential

Location

North-central U.S.

Completion Date

2019

5+

years of operational data

7

wind farms

80-120

wind turbines per site

Challenge

An independent power producer operating approximately 700 wind turbines spread across seven wind farms was looking to enhance communication of outages and reduce discrepancies in energy production reporting. The company needed a software solution to streamline processes and simplify outage reporting and tracking, as well as to glean insights from more than seven years of operational data.

1898 & Co., part of Burns & McDonnell, was hired to analyze and address several tedious processes and close operational data gaps caused by communication outages and data migrations into multiple systems. The client needed a solution that could be implemented across all of its wind farms as well as easily utilized by plant staff for improved daily operations.

Solution

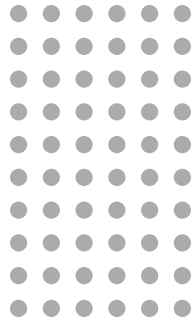
Starting with one wind farm, wind turbine and substation data were collected in a Fenway supervisory control and data acquisition (SCADA) system to begin sorting through datasets and identify why gaps were occurring. The Fenway data was then fed into an eDNA reporting

system, a data management tool, but it could not be augmented or backfilled with important data missed during communication outages. As a result, the eDNA data was exported to Oracle, a different database management system, for data backfilling, post-processing and limited reporting. The Oracle data was used to generate monthly executive-level and financial partner reporting, while eDNA was used to identify real-time wind farm data trends.

However, post-processed reporting from the Oracle system had considerable discrepancies with the real-time data captured in eDNA. Similar issues existed in various forms at all of the client's wind farms.

1898 & Co. helped establish a streamlined database through an OSIsoft PI System environment and supported parts of data migration from eDNA over to the new software solution.

As part of the PI System implementation, we developed recommendations for build-out of the PI System Asset Framework (AF) for smoother integration of daily operations. AF templates



were recommended to help drive standardization of naming conventions and to increase the ease of deploying any future holistic changes affecting the entire wind farm fleet. AF template recommendations also included analytical requirements necessary to meet the client's wind turbine performance, interconnection and financial reporting standards.

1898 & Co. developed a web-based application to enable maintenance staff to update data in real time in the PI System from the field and place all relevant information from all seven sites into one streamlined digital application. Validation rules helped prevent the entry of invalid data, therefore preventing inaccurate reports.

Additional functionality was achieved through template creation to support multiple wind turbine manufacturers and the turbines' attributes. This simplified updating data across hundreds of turbines.

Educating staff on how to use the integrated software solution was also a large part of the solution's success. A training session was conducted with plant staff to answer any questions surrounding use of the software, as well as to address any concerns.

To implement necessary software changes, an agile software development method was used to efficiently design, develop and implement the preferred software solution. The primary objective of an agile software development methodology is to fulfill stakeholder interests and needs at the end of each phase of software implementation. Agile development in the form of scrum teams — comprising the product owner, business analysts, developers, quality assurance testers and a scrum master — provides a collaborative approach to software development and application delivery.

Results

After implementing software and educating staff on best practices for outage reporting and tracking, the independent power producer is reporting favorably on software success. Staff now can accurately capture and respond to field updates such as large precipitation events, maintenance and outages that could impact the amount of energy produced. This data helps the client efficiently and accurately respond to outages and other significant events.

This solution eliminated hours of manual labor to input and migrate data into multiple systems, thereby increasing reporting accuracy for overall energy produced, which has reduced financial obligations.

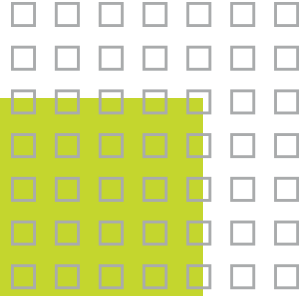
About 1898 & Co.

1898 & Co. is a business, technology and security solutions consultancy where experience and foresight come together to unlock lasting advancements. We innovate today to fuel your future growth, catalyzing insights that drive smarter decisions, improve performance and maximize value. As part of Burns & McDonnell, we draw on more than 120 years of deep and broad experience in complex industries as we envision and enable the future for our clients.



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