CUSTOMER CASE STUDY

EDF Renewables uses the PI System™ to shed light on lost revenue

EDF Renewables - www.edf-re.com
Industry - Power generation

Goal

- Combine the PI System™ operations data with wind forecasts and maintenance crew schedules to inform call-out decisions.

Challenge

- Need to determine whether potential revenue lost from turbine outages merits the cost of an after-hours maintenance call-out.

Result

- Expected savings of $2 million per year in reduced maintenance expenses.

Solution

- The PI System™

It's late on a Friday night in San Diego. Max, a controller in the operations control center (OCC) for EDF Renewables, scans multiple control screens displaying the status of the company's wind turbines scattered across North America. A glance at one screen reveals that a few turbines at a site in Canada are down. After Max realizes he cannot reset the turbines remotely, a fraught but inevitable question arises: should he call out an after-hours maintenance crew? Every hour a turbine is down means more lost revenue. Max knows there is a potentially huge amount of money on the line. But how much? And how much lost potential revenue merits a call-out? Until recently, OCC controllers like Max lacked the information they need to answer such questions and perhaps save enormous amounts of money. Now, thanks to the PI System, Max and EDF Renewables have access to the data they need to make the right decision.

Visibility into revenue at stake

EDF Renewables, a subsidiary of the French energy company EDF, specializes in renewable energy production. EDF Renewables provides grid-scale power across the United States, Canada, and Mexico, producing 16 gigawatts of renewable energy from solar storage and wind energy. The company has been using the PI System since 2009 to collect operations data from its turbines and solar storage facilities. But OCC staff were unable to use this data to make informed decisions about when to send out after-hours maintenance crews. Knowing money was being left on the table, EDF Renewables turned to David Rodriguez, an analytics and intelligence engineer, and his operational-intelligence team to find a solution.

Previously, the OCC relied on tables that measured the number of wind turbines offline against the current wind speed at a site to determine whether to place an after-hours call-out to maintenance crews. But the tables had limitations. They didn't account for fluctuations in wind speed, which change the amount of power expected to be generated over a given time.

The tables also didn't consider how long it would be until the next maintenance crew shift. Maintenance crews typically work 40-hour work weeks. When there is no crew on shift, technicians might be hours away from remotely located turbines. Once on-site, they face a long and potentially dangerous climb up the turbine's 300-to 500-foot body.

The tables did not account for these additional human and monetary costs. "Without visibility into what revenue is actually at stake... it ends up being more of a judgment call than it needs to be," said Rodriguez.

"This whole platform is designed to support our goals of operational intelligence. The idea is, you build systems that take raw data and turn it into actionable information so you can make smarter decisions."

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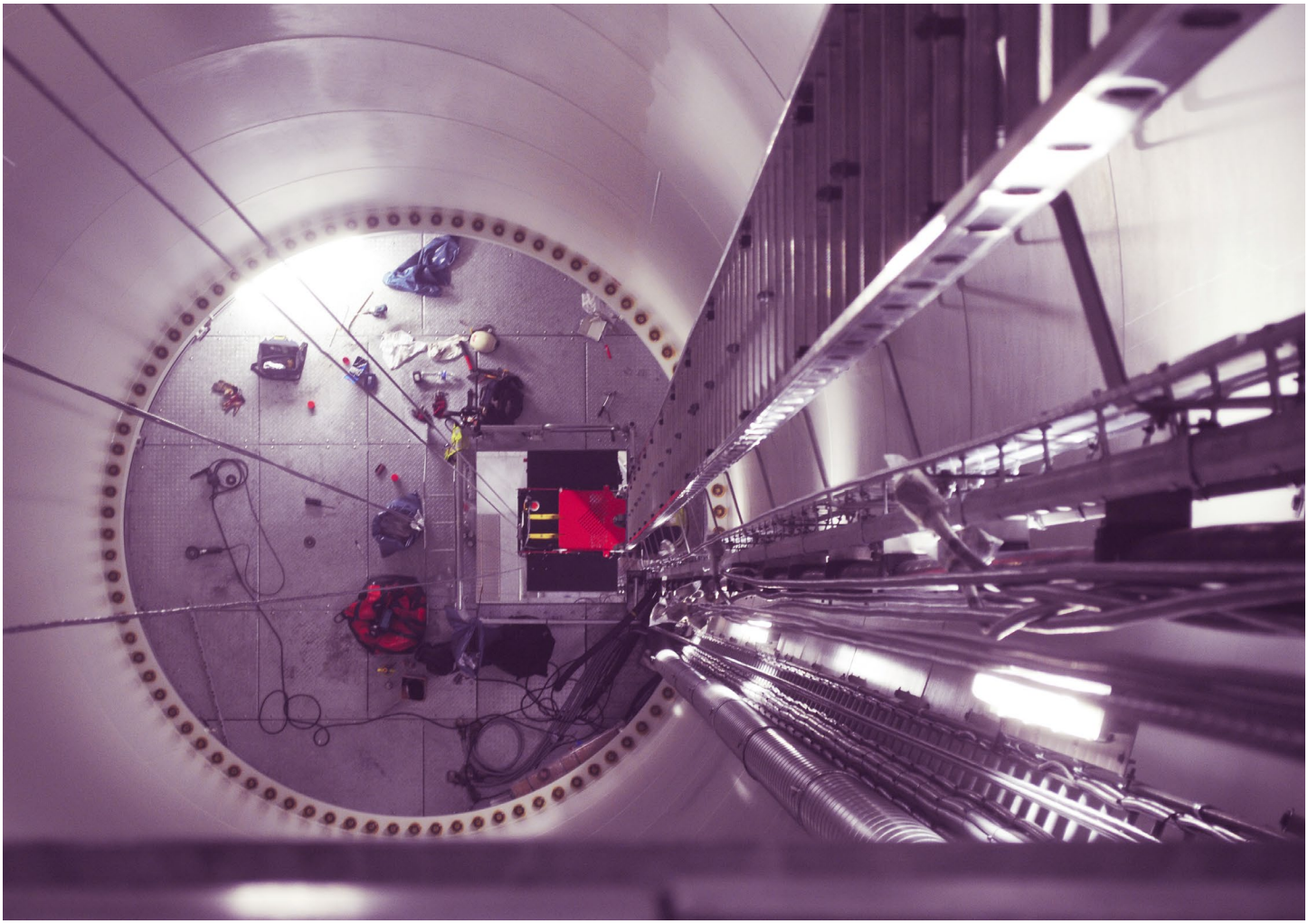
David Rodriguez Sr.,
Analytics and Intelligence Engineer, EDF Renewables



Using old data to new ends

First, Rodriguez and his team identified the factors that affect how much it costs for a turbine to be down while the maintenance crew is out. The team used the Dark Sky weather API to pull in wind-speed forecasts for each site and stored the information in the PI System as data tags. The team also relied on turbine-operations data previously stored in the PI System. They looked at factors like the active power status, long-term downtime status (for turbines waiting on new parts, for example), turbine fault codes, and power-curve forecasts, which predict the amount of power a turbine is expected to produce at a given wind speed.

The team also talked with several asset managers to get a sense of the typical price for power under different conditions. Then they determined the amount of lost revenue that would merit a call-out. Last, they gathered crew-shift information and stored it in an Asset Framework (AF) table.

Next, Rodriguez and his team enlisted the help of Lonnie Bowling and his company Diemus, which specializes in data visualization, to create a custom dashboard for the controllers in the OCC. Bowling had worked with EDF before to build a custom application called Orca that provides real-time visualization of the turbines' operations data.

Dashboards for decision-making

Building on PI System data, Bowling created a new live dashboard inside Orca. The dashboard shows how many turbines are down at a given site and predicts how much an outage will cost. It then indicates whether to perform a call-out depending on the combination of factors Rodriguez and his team identify. The dashboard also displays call-outs in progress and allows controllers to generate new call-outs, which are sent as email notifications to crew members in the field.

Since the dashboards went live about six months ago, there have been close to 700 call-outs. Extrapolated over twelve months, Rodriguez and his team estimate that the new dashboards will save the company about $2 million per year.

PI System data supports custom call-out dashboards. Red boxes display forecast lost revenue until the next maintenance crew shift and the call-out threshold.

For more information about EDF Renewables and the PI System,
watch the full presentation here.