

## WHITE PAPER

# Steps for Solving the IT Challenges Facing the Power Industry

2021 was a significant year for the power and energy industry. Extreme weather events put the reliability of the grid to the test, and cyberattacks on critical infrastructure revealed dangerous vulnerabilities. At the same time, **energy demand has risen 5 percent globally** over the previous 12 months as the economy rebounded from the pandemic and new sources of demand like electric vehicles have grown in popularity.

In addition to these global challenges, modern power plants are tackling issues closer to home: **outdated IT infrastructure, insufficient security postures, and making the most of their data, to name a few.** Whether you're a power plant operator, a private equity investor, or in operations and maintenance, it's important to understand these challenges so you can make strategic decisions for the success of your plant.

# Modernizing Infrastructure

**If you were to list your plant's top priorities, would "IT infrastructure" make the list?** For many modern power plant operators, literally keeping the lights on often takes precedence over keeping devices and OS up to date.

However, prioritizing IT infrastructure has far-reaching benefits. For example, when plants leverage the Cloud, it helps to manage costs, improve user accessibility to remote locations, and secure IT and OT assets. As the fleet grows, centralizing IT gets more complicated. Moving to the Cloud improves management and standardization.



In addition, in the power industry, using the Cloud makes it possible to acquire new power generation companies much more quickly than previously possible. Instead of having to buy additional equipment and add servers to each new location, companies can simply get connected to the cloud service and have access to all the information they need. Cloud technology also makes it possible for plant employees working remotely to access the data they need from anywhere.

## Why Power Plants Don't Modernize Their Infrastructure

With all these benefits, why don't more power generation companies modernize their legacy equipment and outdated systems?

To start, it can be expensive to upgrade these systems and retrofit your plant, and it may not even make business sense. For example, if your power plant has a defined lifespan, the investment in updated infrastructure might outweigh the expected return by the time the plant's lifespan is over.

Another issue causing behind-the-times infrastructure is that some third-party IT companies don't treat IT operations at a power plant as critical infrastructure. The problem is that IT is critical infrastructure for modern power plants. Without understanding that crucial point, some third-party IT companies who aren't highly experienced in the power industry may view the plant as just another standard small business and not fully address the plant's needs.

Without a modernized IT infrastructure built on the Cloud, your plant likely isn't using the best tools available and may struggle to meet compliance requirements. Your plant may be falling short of reliability standards. You may have poor implementations or misconfigurations. And you may not be meeting your business objectives.

### KEY TAKEAWAY:

Having an updated IT infrastructure helps the modern power plant run more efficiently and cost-effectively. Plus, it allows for better preparedness for streamlined future acquisitions. But business concerns and non-power industry-experienced third-party IT companies can make it difficult to upgrade.



## Steps to Modernize Your Plant's IT Infrastructure

- Find an IT partner that specializes in the power and energy industry.
- Assess your plant's current systems, apps, and security to determine gaps.
- Prioritize remediation based on the best interest of plant operations.
- Extend your infrastructure to the Cloud.
- Apply security best practices from the start.
- Monitor systems and data to ensure optimal operational efficiency.

47%

of organizations planning to grow their IT budget in 2022 are doing so to upgrade outdated IT infrastructure.

—SPICEWORKS ZIFF DAVIS



### Infrastructure Case Study

**Hull Street Energy**, a private equity firm that invests in middle-market power companies, needed help integrating 45 new power generation companies. Many of the plants were remote, and they needed a solution for sharing information while keeping sensitive data secure. Together, we determined that a standardized, cloud-based architecture was what they needed. With this security-first architecture, they had a user-friendly environment that was NERC compliant and poised for any future migrations or acquisitions.

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#### KEY TAKEAWAY:

Whether you're a power plant operator, investor, or plant manager, it's important to work with an IT partner that specializes in the power and energy industry so that you can have a standardized infrastructure that prevents downtime and enables flexibility.

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# Creating a Solid Cybersecurity Posture



# 60%

of organizations are still in the “awareness phase” of their operational technology security journeys

—GARTNER RESEARCH

When you consider that so many power generation companies have an insufficient cybersecurity posture, with multiple vulnerabilities they don’t realize are there, it’s alarming to realize that **the average critical infrastructure vulnerability exists “in the wild” for 1,897 days.**

Critical infrastructure is unique. The work performed with critical infrastructure is essential to the economy, and cybercriminals acting on behalf of foreign governments seek to disrupt availability and stop the delivery of critical services. Unfortunately, these criminal operations are often mature and effective. Modern power plants need to evolve their cybersecurity programs from just preventative measures to proactive threat detection and response.

## Organizational and Individual Roadblocks to Cybersecurity in the Power Industry

A mature cybersecurity program is reliable and resilient, but it’s challenging to get to that point. At a minimum, you are required to meet NERC standards for basic critical infrastructure protection. And unlike traditional security in IT environments, power generation companies also have to secure OT assets. So while conventional IT security best practices serve the business network, they aren’t sufficient to prevent a compromise of control systems and network.

In the power industry, it isn’t about a balance of usability and security as it is with traditional IT. Instead, the goal is to increase operational resilience without limiting what operators and technicians can do. As most power plant operators will tell you, the ultimate goal is 100 percent uptime. How do you reach that goal? Operational resilience.

Achieving operational resilience can start small. For example, some seemingly innocuous habits are deeply ingrained and can have far-reaching effects on security. This could be an employee disabling a security feature that makes it convenient to access the network but in turn compromises the security of the plant.

Other problems may be with managed service providers that don’t have an energy background. These providers may not understand the policies and controls regulating the plant and therefore may make architectural decisions that are not in the best interest of the internal infrastructure (e.g., removing critical firewalls or not implementing the proper network segmentation).

Failing to keep your cybersecurity program up to date opens you up to liabilities and may end up being costlier than keeping it updated in the first place. If the plant is compromised, your critical systems are at risk, which could ultimately have devastating consequences on lives and livelihoods.

### KEY TAKEAWAY:

Cyberattacks are a daily occurrence. Security should be viewed as a key enabler for operational efficiency.



## Tips to Enhance Your Plant's Cybersecurity Posture

- Get a partner to conduct an assessment and ensure you meet NERC standards and other best practices.
- Ensure you have both IT and OT cybersecurity programs.
- Be aware of all remote access and externally facing services and take charge of them.
- Don't bypass security controls without fully understanding implications of doing so.
- Have a team that can identify and respond to threats.
- Implement least-privilege access and lock down admin accounts.
- Ensure that physical security controls are in place to protect assets.

**Energy is ranked at #6** for industries with prevalence of ransomware detections in 1H 2021.

— FORTINET



### Cybersecurity Case Study

**Garrison Energy Center**, a 309MW combined-cycle gas-fired electric generating facility, was under new ownership, and they didn't have the information they needed about security vulnerabilities and whether their previous owner still had backdoor access.

We performed an assessment and remediated the vulnerabilities found. Then we set them up with two resources: a secure remote access tool to give contractors and vendors separate access, and an automated system that monitors who is coming in and out of the controls network. With these in place, Garrison's team has peace of mind, knowing that they are compliant and prepared.

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#### KEY TAKEAWAY:

Any investment you make improving your security posture will be far less than the consequences if you're breached.

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# Leveraging Data Analytics



**In today's power industry, there is more data available than ever before.** With emerging technologies like artificial intelligence, plants can utilize their data to make faster and more intelligent decisions to optimize operations.

**"Once processed, engineers can use data to predict problems before they affect operations. This allows maintenance, reliability, safety, plant engineering, and other departments to make quicker, more-intelligent decisions about their operations. With these educated decisions come cost savings, cost avoidances, improved maintenance and reliability, better safety, and improved heat rate."**

—POWER

For example, peaker plants can take advantage of data analytics so they can run optimally during times of peak load (e.g., when customers run air conditioning in the summer). Data and AI help these plants predict weather patterns so they can make better decisions about maintenance and operate at optimal production.

## Why Leverage Data Analytics

Without leveraging data analytics, plants can't predict things like uptime, revenue generation, and risk. That makes it more likely that they will run when it's least efficient and will therefore fail to generate projected revenue.

For example, without data analytics, there's a risk of dependency on manufacturers' power needs: as demand goes up, power needs go up. The plant may only run 8 to 5, Monday through Friday, which puts plants at risk for significant waste.

Data analytics also allow for predictive maintenance so that plants can schedule downtime instead of having to react to an unplanned outage. Unscheduled outages put stress on the plant and stop them from generating electricity they could be selling.

Power and energy firms need to make decisions about optimizing production so that they can run (and not run) when it is most efficient. Production, scheduling, and historical data can be aggregated to give you a holistic view, allowing you to determine if you are optimizing when plants are running and the costs of not doing so.

### KEY TAKEAWAY:

Take advantage of the abundance of data to be more cost-efficient and improve uptime with predictive analytics.



## Tips for Overcoming Data Analytics Challenges in the Power Industry

- Leverage the Cloud for a cost-effective way to make data more accessible and secure.
- Invest in the right tools that transform data into actionable insights.
- Identify areas where having the right data can lead to operational improvement.
- Choose a partner to help you get it right the first time so you don't have to spend time and money rectifying costly mistakes that put the plant at risk.

# 10.22%

Estimated compound annual growth rate of the big-data analytics market in the energy sector between 2020 and 2025

—REPORTLINKER

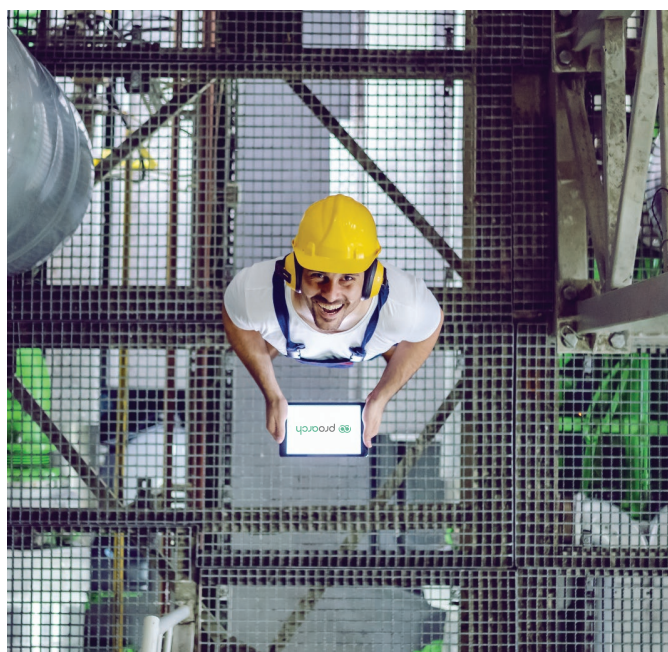


## Data Analytics Case Study

A power utility was looking for a solution that reduces the demand during peak hours and increases demand at non-peak hours to reduce grid load and maintain better grid health. We developed the analytical tools that enabled them to put in place a better demand planning structure.

### KEY TAKEAWAY:

Lay a solid data analytics foundation to create better operating and financial performance.





**ProArch** is an IT services and consulting organization with deep experience in the power and energy industry. For nearly 20 years, we have been helping our independent power producer clients—including private equity, power plant operators, and plant managers—by delivering IT consulting and technology solutions that secure revenue streams, maintain operational reliability, and boost resiliency. We wrap proactive services and growth strategies around your technology, data, and applications so you can seize opportunities for market expansion and minimize preventable disruptions.

**Contact us** today to learn how we can marry your operational initiatives with an IT strategy that addresses aging infrastructure, cyber threats, and operational downtime so that your bottom line stays intact.

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