



OpenPWR Visualization & Control

An Open Platform for Modern Renewable
Operations

Topics

- Panacea Introduction
- OpenPWR Platform Introduction
- OpenPWR Site Visualization

Panacea Technologies Highlights

- Founded in 1996
- Automation Solutions Company
 - Automation and validation services
 - Capabilities ranging from small system upgrades to turnkey solution delivery (\$1K to \$20M) and long-term site support
 - Hardware and Software
 - Successful portfolio of products including, OpenPWR, OpenBIO Product Platform, Panacea Update Manager, FHX File Viewer etc.
- Heavily focus on the importance of standards and project design/execution

Accolades



- Panacea had two engineers named in the Engineering Leaders Under 40 Program in 2017, 2018, 2019, 2020, and 2021.
- Less than forty engineers are named each year, and Panacea was honored to receive two of the nominations each of the last four years
 - Panacea was named Systems Integrator of the year by Control Engineering and Plant Engineering Magazine
 - Panacea was extremely honored by receiving this prestigious award and the endorsement it carries
- OpenBIO received an Innovator Award from Pharmaceutical Manufacturing Magazine in 2018.



Industry Recognition

- Featured in more than 30 Industry Publications in the past 3 years

**PLANT
ENGINEERING**

**CONTROL
ENGINEERING**

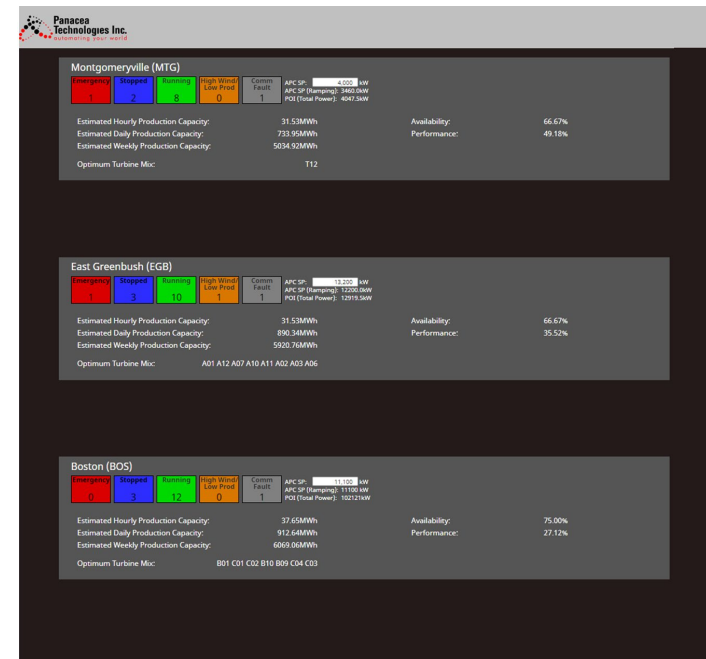
CONTROL
PROMOTING EXCELLENCE IN PROCESS AUTOMATION

AutomationWorld®

InTech

The OpenPWR Platform

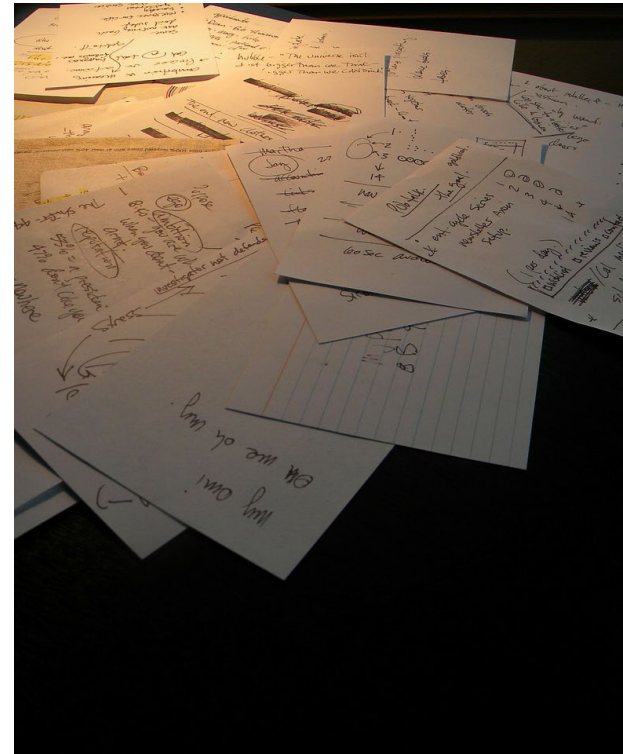
OpenPWR is a cross-functional visualization platform that provides uniform control and reporting regardless of resource, hardware manufacturer, or current visualization platform.



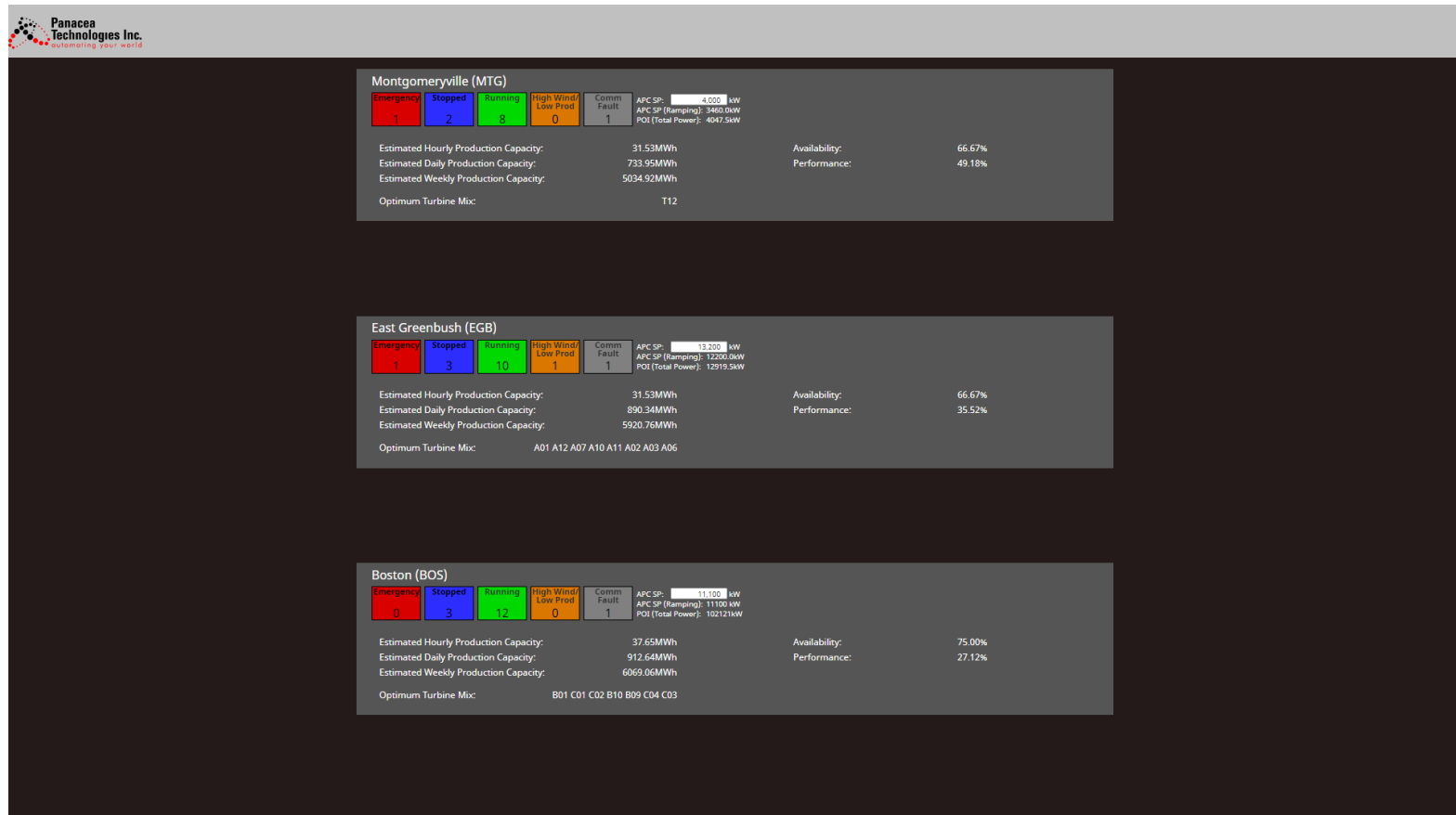
OpenPWR is able to consolidate cross-country and transnational renewable energy sites onto a single platform allowing standardized company-wide remote monitoring and control of the entire renewable portfolio.

Why Consolidate Control?

For renewable energy operators, operating multiple sites, with multiple sources and multiple automation platforms, consolidating data for meaningful analysis can be a time-consuming challenge. Consolidating to a single platform allows users to quickly analyze data for key energy generation forecasts and other economic markers.

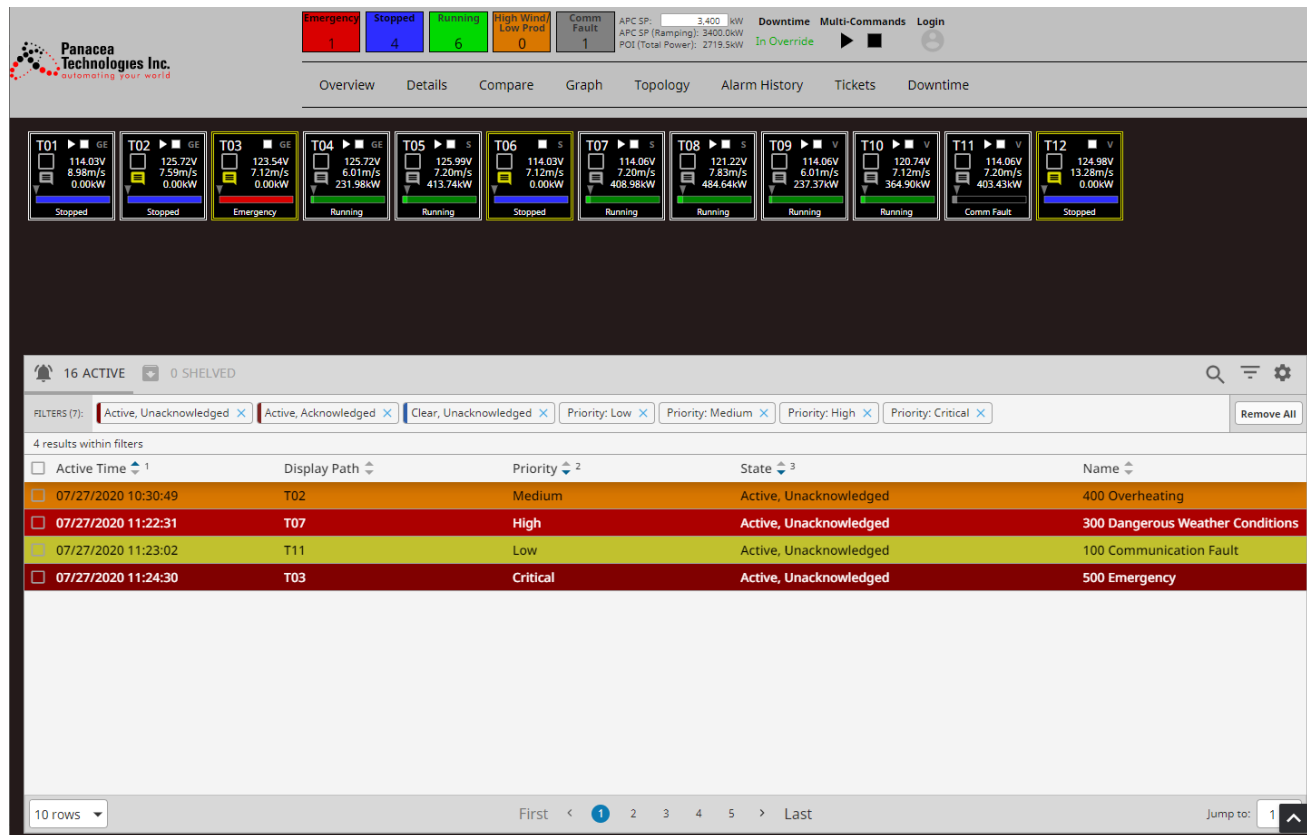


Corporate Level View



OpenPWR's corporate view aggregates site data to provide performance to determine key predictive and operational drivers

Site Level View



The site view allows for customized and tailored monitoring solutions. This view provides a summary of conditions, output from every turbine or panel, and all active alarms.

Additional Site Level Views

Alarm History

Start Date: Jul 24, 2020 11:38 AM End Date: Jul 27, 2020 12:38 PM

22 alarm events
2020/07/24 - 2020/07/27

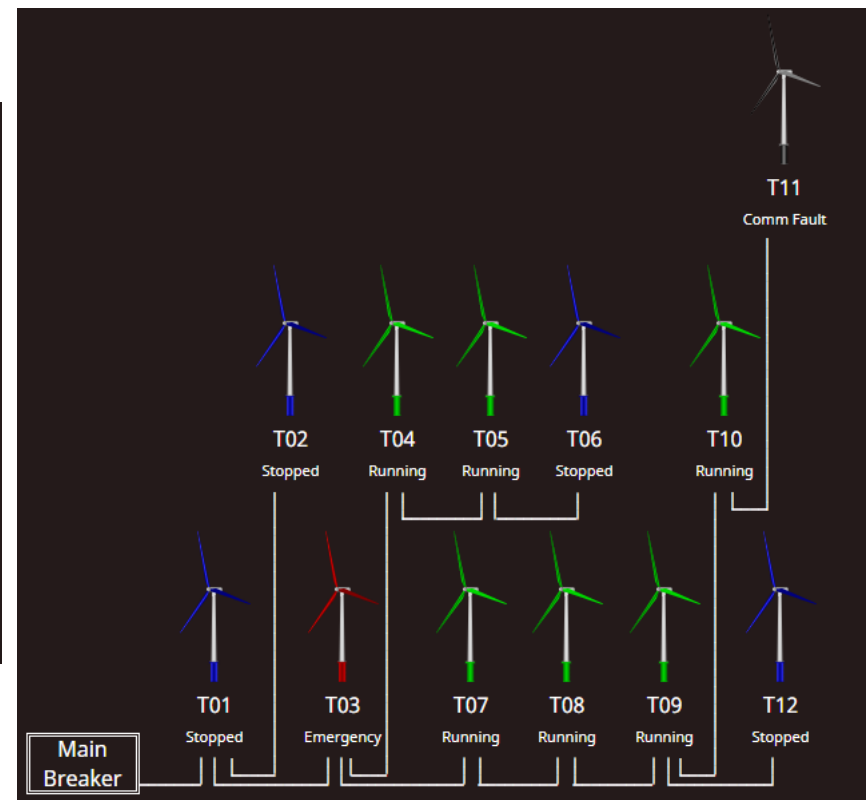
FILTERS (7): Active X Acknowledged X Cleared X Priority: Low X Priority: Medium X Priority: High X Priority: Critical X Remove All

22 results within filters

Event Time	Name	Event State	Priority	State	Display Path
07/27/2020 10:10:49	400 Overheating	Active	Medium	Active, Unacknowledged	T02
07/27/2020 10:26:25	100 Communication Fault	Active	Low	Active, Unacknowledged	T08
07/27/2020 10:30:49	400 Overheating	Active	Medium	Active, Unacknowledged	T02
07/27/2020 11:22:20	500 Emergency	Active	Critical	Active, Unacknowledged	T03
07/27/2020 11:22:31	300 Dangerous Weather Conditions	Active	High	Active, Unacknowledged	T07
07/27/2020 11:22:40	100 Communication Fault	Active	Low	Active, Unacknowledged	T11
07/27/2020 11:23:02	100 Communication Fault	Active	Low	Active, Unacknowledged	T11
07/27/2020 11:24:30	500 Emergency	Active	Critical	Active, Unacknowledged	T03
07/27/2020 11:24:32	100 Communication Fault	Active	Low	Active, Unacknowledged	T03
07/27/2020 10:10:12	400 Overheating	Ack	Medium	Active, Acknowledged	T02
07/27/2020 10:10:12	100 Communication Fault	Ack	Low	Active, Acknowledged	T06
07/27/2020 10:28:54	400 Overheating	Ack	Medium	Active, Acknowledged	T02
07/27/2020 10:28:54	100 Communication Fault	Ack	Low	Active, Acknowledged	T08
07/27/2020 11:24:19	500 Emergency	Ack	Critical	Active, Acknowledged	T03
07/27/2020 11:24:39	100 Communication Fault	Ack	Low	Active, Acknowledged	T03
07/27/2020 10:10:12	400 Overheating	Clear	Medium	Cleared, Acknowledged	T02
07/27/2020 10:10:12	100 Communication Fault	Clear	Low	Cleared, Acknowledged	T06
07/27/2020 10:28:54	400 Overheating	Clear	Medium	Cleared, Acknowledged	T02

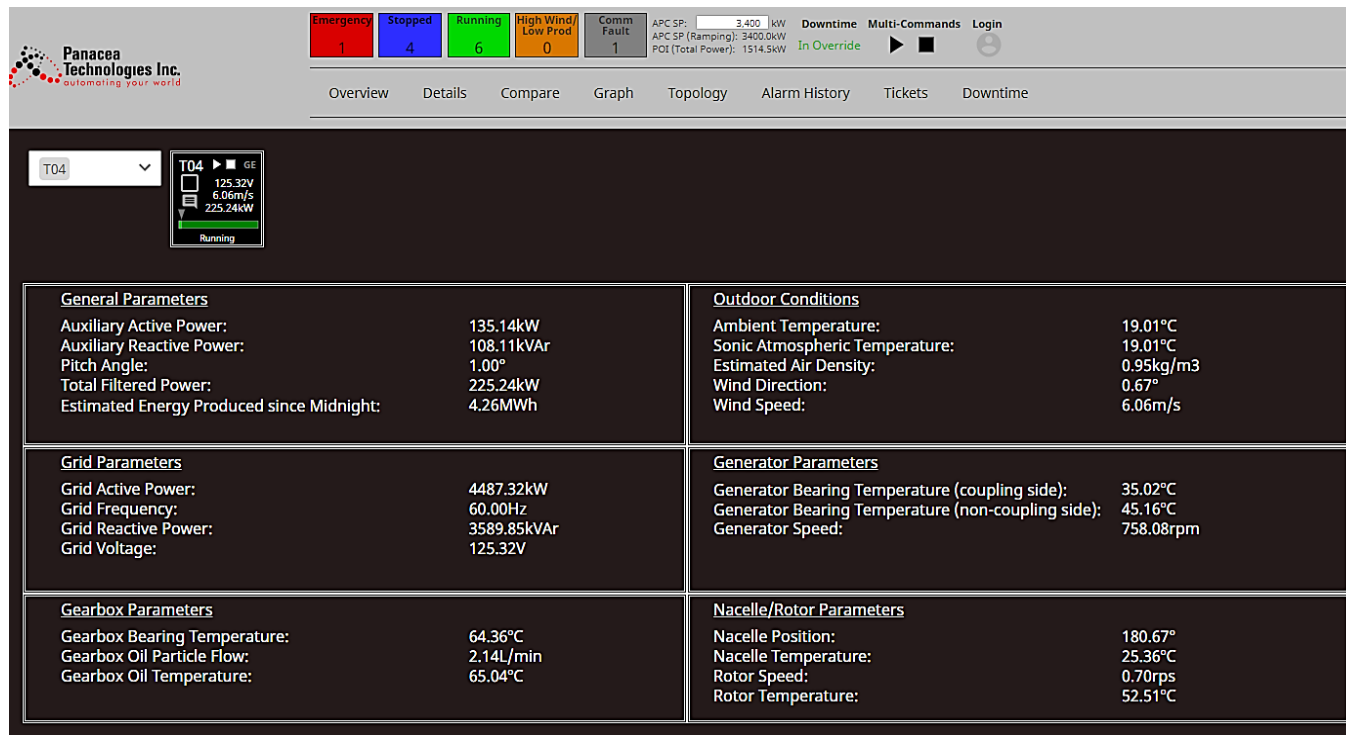
25 rows

Topography View



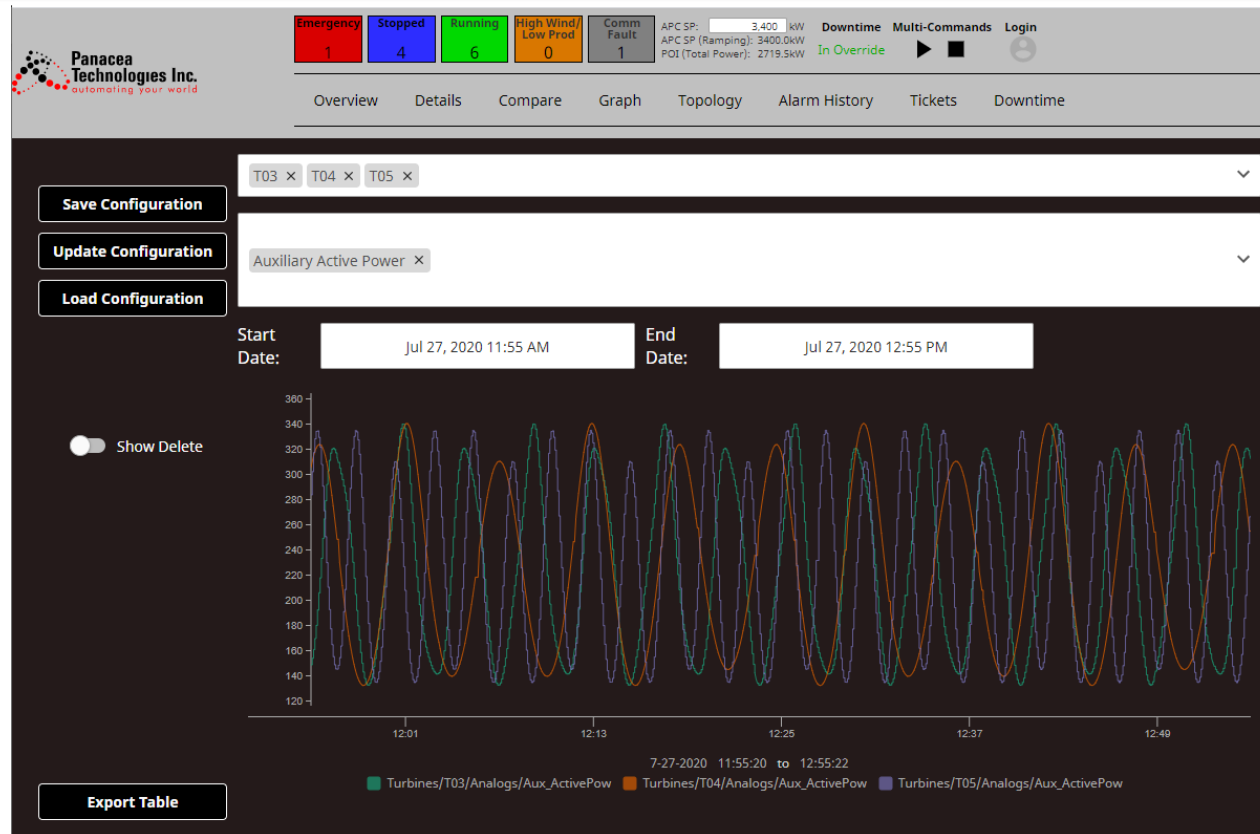
All alarms are archived in **Alarm History**. **Topography** view provides a graphical display of the communications fiber to provide insight into substation and fiber related issues.

Source Level View



OpenPWR provides real-time monitoring of specific turbines and other sources and their related metrics and environmental data.

Analytics and Data Management



Generating millions of data points annually, OpenPWR is highly adaptable and can provide data averages and continuously generated graphs. Data can be exported in various formats including .pdf reports, tailored for different stakeholders.

Downtime Analysis

Panacea Technologies Inc.

Automating your world

Emergency

Stopped

Running

High Wind

Low Wind

Comm

Fault

APC SP: 3,400 kW

APC SP (Ramping): 3400.0kW

POC (Total Power): 2719.9kW

Downtime

Multi-Commands

Login

In Override

Overview

Details

Compare

Graph

Topology

Alarm History

Tickets

Downtime

Start:2020/07/27 00:00:00

End:2020/07/27 23:59:59

Filter table...

Subsite	Turbine	StartTime	EndTime	DowntimeFault	DowntimeCategory	DowntimeCode	Fault	EnergyLossMWh	Approval				
WindFarm	T10	07/27/2020 11:13:54	07/27/2020 11:24:54	Weather	Owner	Safety	Manual Stop	0.03	None				
WindFarm	T11	07/27/2020 11:13:54	07/27/2020 11:15:51	Weather	Owner	Safety	Manual Stop	0	None				
WindFarm	T12	07/27/2020 11:12:20		Weather	Owner	Safety	Lockout	3.50	None				
Start Time		End Time (NULL)		Downtime Fault		Downtime Category		Downtime Code		Fault		Update	Approve
07/27/2020 11:12:20		Select date...		Weather		Owner		Safety		Lockout			
WindFarm	T06	07/27/2020 11:12:20		Weather	Owner	Safety	Active Power Control	0.54	None				
WindFarm	T03	07/27/2020 11:12:20	07/27/2020 11:24:37	Weather	Owner	Safety	Active Power Control	0.20	None				
WindFarm	T02	07/27/2020 11:12:20		Weather	Owner	Safety	Active Power Control	0.53	None				
WindFarm	T01	07/27/2020 11:12:20		Weather	Owner	Safety	Unknown	1.12	None				
WindFarm	T03	07/27/2020 10:28:49	07/27/2020 11:12:20	Economic Curtailment	Owner	Information	Active Power Control	0.18	None				
WindFarm	T01	07/27/2020 10:24:44	07/27/2020 11:12:20	Turbine	Manufacturer	Notification	Unknown	0.39	None				
WindFarm	T12	07/27/2020 10:23:01	07/27/2020 11:12:20	Turbine	Owner	Safety	Lockout	1.31	None				
WindFarm	T01	07/27/2020 10:22:08	07/27/2020 10:24:42	Turbine	Manufacturer	Information	High Wind/Low Production	0.03	None				
WindFarm	T02	07/27/2020 10:20:53	07/27/2020 11:12:20	Economic Curtailment	Owner	Information	Active Power Control	0.19	None				
WindFarm	T08	07/27/2020 10:15:24	07/27/2020 10:26:25	Economic Curtailment	Owner	Information	Active Power Control	0.03	Review				
WindFarm	T06	07/27/2020 10:14:53	07/27/2020 11:12:20	Economic Curtailment	Owner	Information	Active Power Control	0.22	None				
WindFarm	T13	07/23/2020 14:58:16		Economic Curtailment	Owner	Information	Active Power Control	0.01	None				

Manual Addition

Update Events

Merge Events

Split Event

Alter Approval

Show Delete

Configure Options

Configure Override

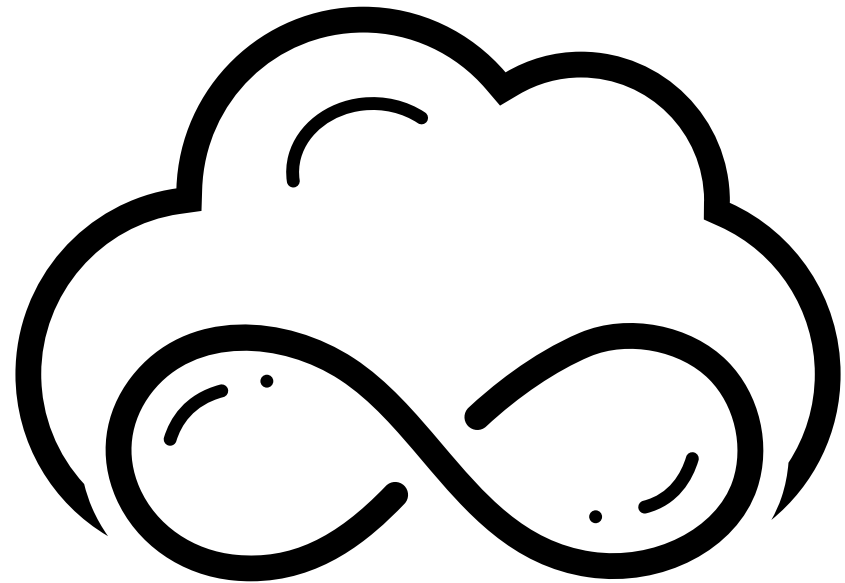
Export Table

OpenPWR's automated downtime log allows for a more robust analysis of the impact of both internal and external events. Events are assigned to a fault and owner and can be split or merged. A robust log provides insight into the key causes and costs of different downtime events, allowing users to improve availability and determine if incidents are part of a trend and if corrective procedures area followed.

Unlimited Licensing Model

OpenPWR's unlimited licensing model is designed to be a onetime cost, including the deployment and integration of the platform, drastically reducing costs when compared to other packages.

Examples:



Site type	Number of Turbines	Number of Technologies	Est. Deployment & License Cost
Small windfarm	25	1	\$ 90,000
Large windfarm	100	3	\$ 140,000

Capabilities

- Complete suite of project capabilities including:
 - Feasibility Studies
 - SOP Creation
 - Design Document Authoring
 - Programming and Configuration
 - Hardware Design and Panel Fabrication (with partner)
 - Testing
 - Validation
 - Startup and Commissioning
 - Long Term Support
 - Project Management
- Standalone services including the above items as well as:
 - Automation Network Design
 - Serialization
 - Virtualization
 - Legacy install base evaluations and migrations
 - Automation asset and code management
 - On-site support
 - Data Historization and Reporting
 - Integration with Enterprise Systems (ERP, MES, PLM, etc.)

Platforms and Certifications

Certified Partnerships:

**Rockwell
Automation**



inductive
automation

synTQ
Application Partner

vmware®



 **kepware®**



GE
Intelligent Platforms



THINMANAGER®
A Rockwell Automation Technology



Matrikon®

OPTO 22
Automation made simple.

Expertise with available References:

YOKOGAWA



Honeywell



DELTA V

SIEMENS

Panacea Update Manager

Panacea Technologies recently launched the Panacea Update Manager, which automates the process of patching Operating Systems for Automation Platforms.

Panacea Update Manager works by taking vendor recommended patch definitions from GE, Rockwell Automation/Allen Bradley, Siemens, OSI soft, and Wonderware and ensures only vendor approved Microsoft OS patches are deployed on your networks.

The software ensures your Computer Networks receive the latest OS patches keeping your infrastructure secure, but it also ensures potential downtime events are eliminated by only deploying tested patches.

Visit <https://www.panaceatech.com> for more information.