

World Leader in OT

More Users, More Solutions, More Projects
Delivered with 100% Customer Satisfaction

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powering the future

OSI Overview

- Leading supplier of Operation Technology (OT) solutions
- Founded in 1992, acquired by Emerson in 2020
- Headquartered in Minneapolis, MN
- All USA developed Technology
- Over 600 Systems in Operation
- Strong in Cyber Security and NERC CIP



Served Markets:

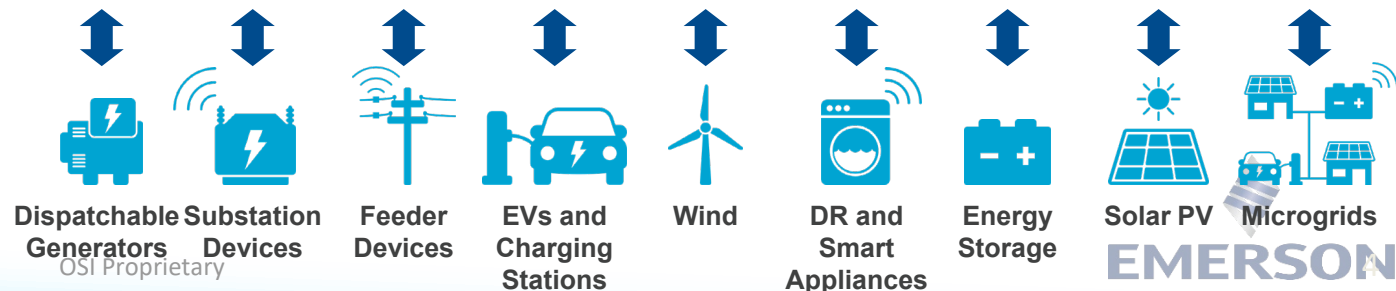
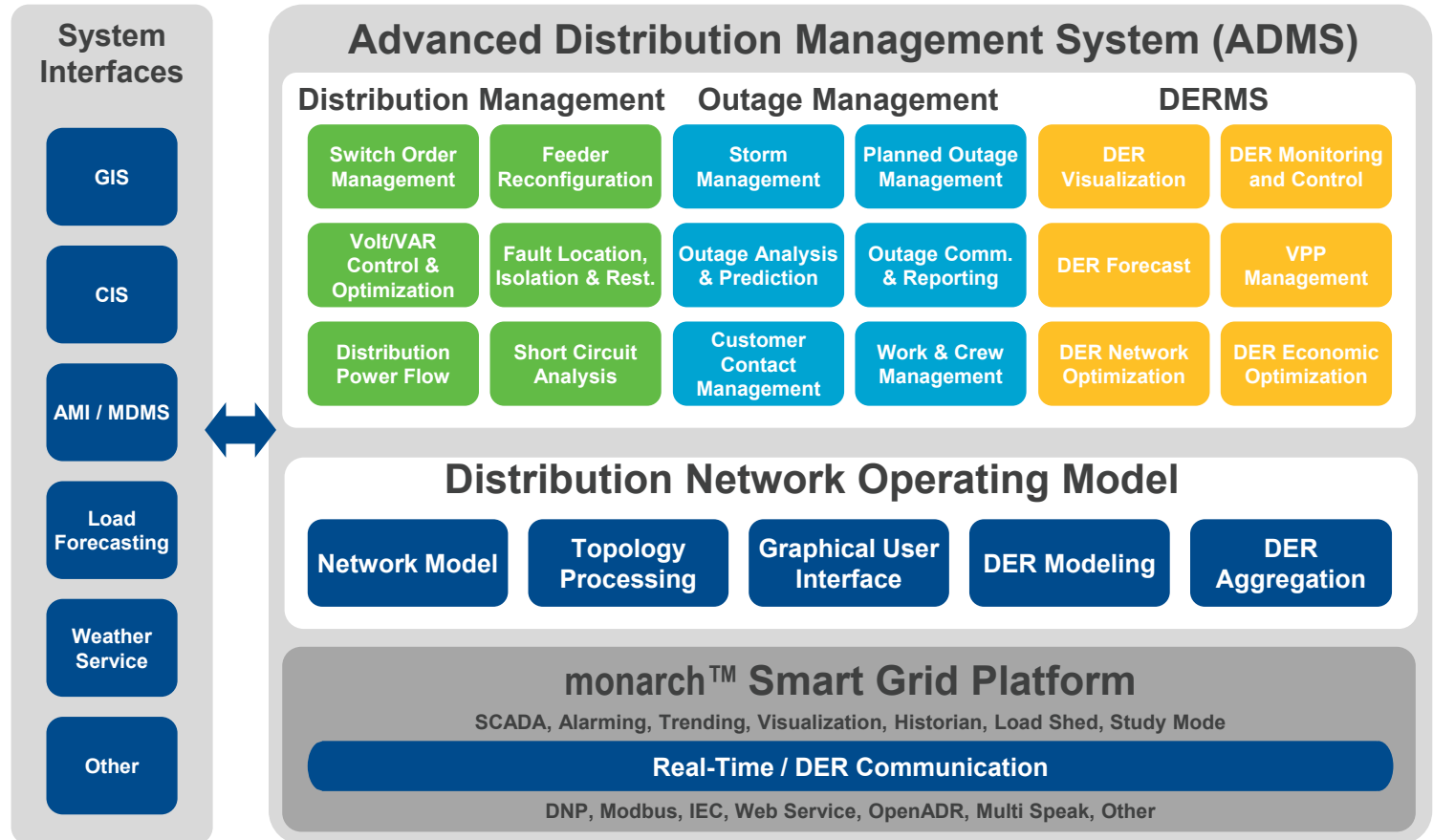
- Electricity
- Generation
- Transmission
- Distribution
- Renewables
- Micro-grids
- Oil and Gas
- Water

Technology Needs of DER in Grid Management

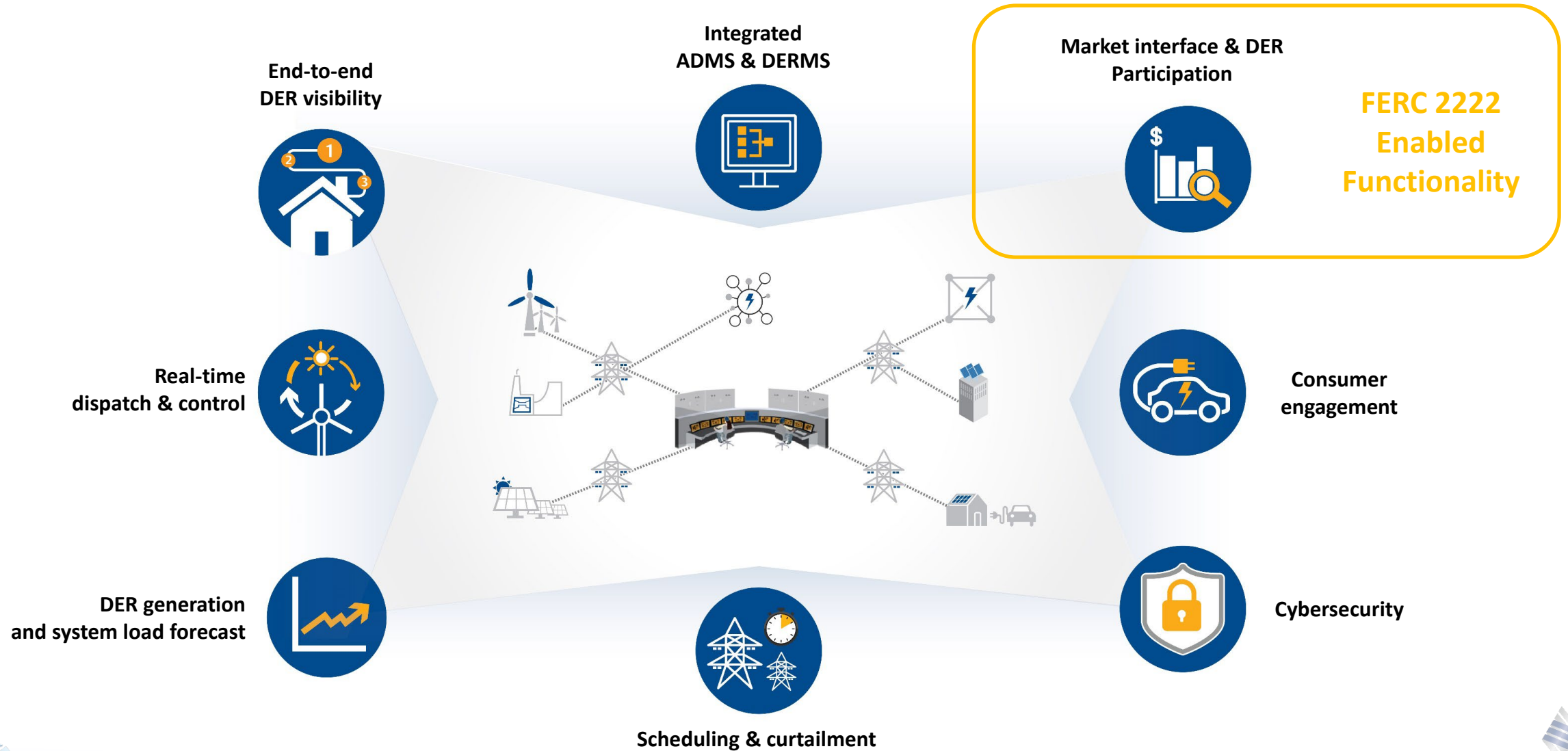
- **Increased System Reliability**
 - Provide real-time situational awareness of network conditions from all grid devices including DER
 - Alarm and respond to avoid adverse grid conditions (overloads, outages, etc.)
 - Ensure balanced network with orchestrated management of all distribution grid resources, both retail and wholesale (Powerflow, Volt/Var Optimization, etc.)
- **Enhanced Visibility and Operational Safety**
 - Improved network visibility of distribution real-time conditions for operators and field crews (can include over 1,000 people)
 - Safely control all grid distribution equipment in a coordinated way
 - Reduce time to analyze and respond to network conditions (i.e. improving outage restoration times)
- **Focus on Customer Experience**
 - Provide accurate network information in real-time (i.e. outage restoration time)
 - Smarter grid management to avoid adverse grid conditions (i.e. brown outs)
 - Enablement of state jurisdictional approved DER programs

Building a Comprehensive DER Management System (DERMS)

- Connectivity to all end-devices in real-time (SCADA, DER, etc.)
- Significant software functionality and configuration of data
- Multiple System Interfaces
- Cyber Security and networking considerations
- Disaster Recovery/Back-up contingency planning



Solving Challenges Through Distributed Energy Management



OSI DERMS Project Case Studies



PSEG New Jersey

Production System ADMS + DERMS

Primary Use Cases:

- Real-time solar estimation and solar PV overload analysis
- System-wide visibility of distributed solar growth
- Smart inverter voltage response coordination with traditional voltage control devices
- Evaluate system performance under different solar penetration levels and weather scenarios

DER: Solar PV

Generation: >1000 MW



Sacramento Municipal Utility District

Production System ADMS + DERMS

Primary Use Cases:

- Real-time visibility, forecasting and control of all DER's
- Fully integrated and managed within the ADMS
- Integrate with DER production smart meters
- Ability to use DERs in real-time to solve network violations
- Schedule DER power and control modes
- Schedule Virtual Power Plants of DERs in CAISO EIM market
- Dispatch DERs to minimize operating costs

DER Type: Solar PV, EVs, Storage, spinning generation, DR

Generation: >300 MW



Portland General Electric

Production System ADMS + DERMS

Primary Use Cases:

- Real-time visibility, forecasting and control of all DER's
- Demand response scheduling and dispatch for Demand Reduction via Enbala
- Enable DER utilization and economic potential
- Integrate DER into real-time Distribution operations

DER Type: Battery, Solar, Wind, Demand Response, spinning generation

Generation: >3,902 MW



Commonwealth Edison Pilot

Production System DERMS

Primary Use Cases:

- Forecast substation transformer overloading from excessive generation
- Ability to intelligently curtail solar during overloads
- Ability to interface to real-time digital simulator for lab verification

DER Type: Solar, Wind

Generation: >100MW over 3 feeders



Saint John Energy

Production System ADMS + DERMS

Primary Use Cases:

- DER Forecasting and Load Forecasting for optimal DER scheduling and dispatch
- Monthly peak load reduction to reduce demand charge
- Interface with 3rd party DR head-ends for peak load reduction
- Real-time network information incorporating DER into decisions
- DER dispatch strategies to provide optimal network benefits

DER Type: DR, solar PV, battery storage

Generation: >17 MW



Toronto Hydro

Production System DERMS

Primary Use Cases:

- Accurate DER and load forecasts to inform dispatching decisions
- Coordinated DR Program and DER dispatch to reduce feeder demand
- Real-time network information incorporating DER into decisions
- DER dispatch strategies to provide optimal network benefits
- Integration with 3rd party D-SCADA and DMS

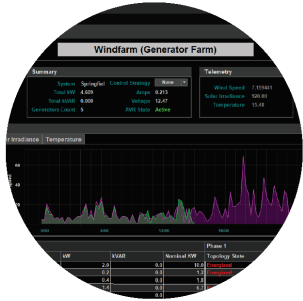
DER Type: DR, solar PV, storage, spinning generation, Industrial

Generation: >200 MW

Functionality Enabled with FERC 2222

Grid Management

System/Market Interaction



Dispatch

Schedule flexible DER assets and manage them while distribution grid configuration and conditions change



Curtailement

Use DER to resolve adverse grid conditions (overloads, etc.) and ensure service reliability



Ancillary Services

Enable coordination and balancing between Transmission and Distribution networks



Balancing Services & Grid Stabilization

Increase/decrease energy generation of manageable assets in real-time



Renewable Energy Trading

Combine diverse energy sources and participate in energy markets

Software Approach for Enabling FERC 2222



- Ability to model diverse DERs & renewable generation assets, aggregate DERs and group logically

- Uses data profiles for individual DER and forecast/schedule functions to determine capacity
- Enable operators to schedule and forecast individual and aggregated DERs

- Evaluates available DER and dispatches based on grid optimization
- Allow utilities to aggregate DERs and offer in real-time or day-ahead markets

- Monitor and dispatch controls to generation resources; ability to disaggregate control to DER
- Determines optimal individual DER dispatch based on network constraints

- Near real-time performance assessment and real-time individual DER non-compliance reporting

Key Takeaways

- **Reliable and safe grid operations must be the utility #1 priority which requires holistic view of all grid activity including DER impact**
- **Utilities need real time visibility and control to DERs to ensure safe and reliable service**
- **Significant benefit to grid reliability will be enabled as DER is adopted and included in real-time grid management activities**
- **Software functionality to manage the electric grid is already complex, adding DER management and FERC 2222 capabilities requires even more centralized orchestration**
- **Success will also depend on ensuring harmonization with individual state public policy initiatives so utilities can continue implementing state programs and discharging any state required obligations**

Thank You!

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