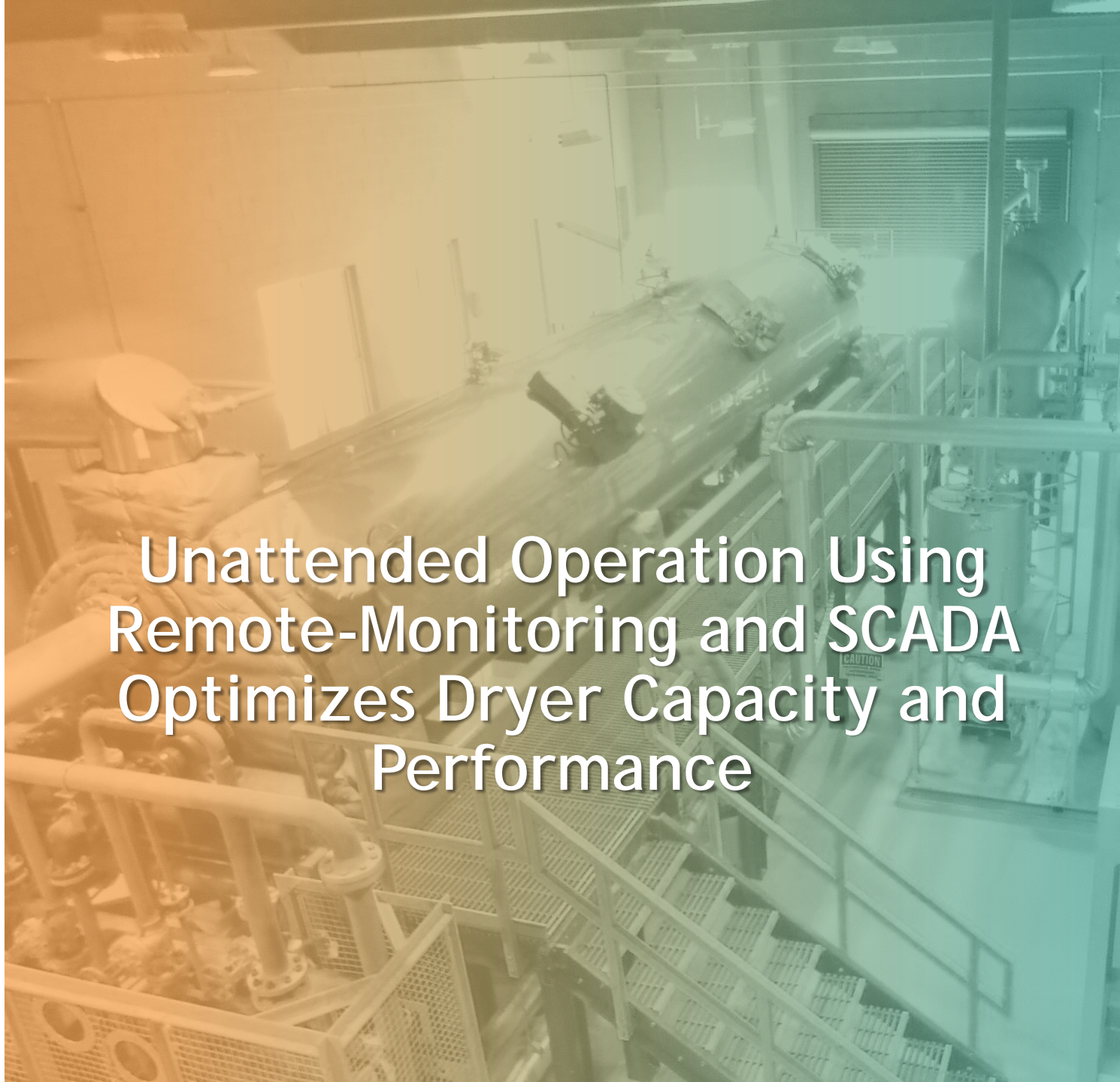




BCR

Solid Solutions

Unattended Operation Using
Remote-Monitoring and SCADA
Optimizes Dryer Capacity and
Performance



Case Study: Wisconsin Dells - Lake Delton WWTP

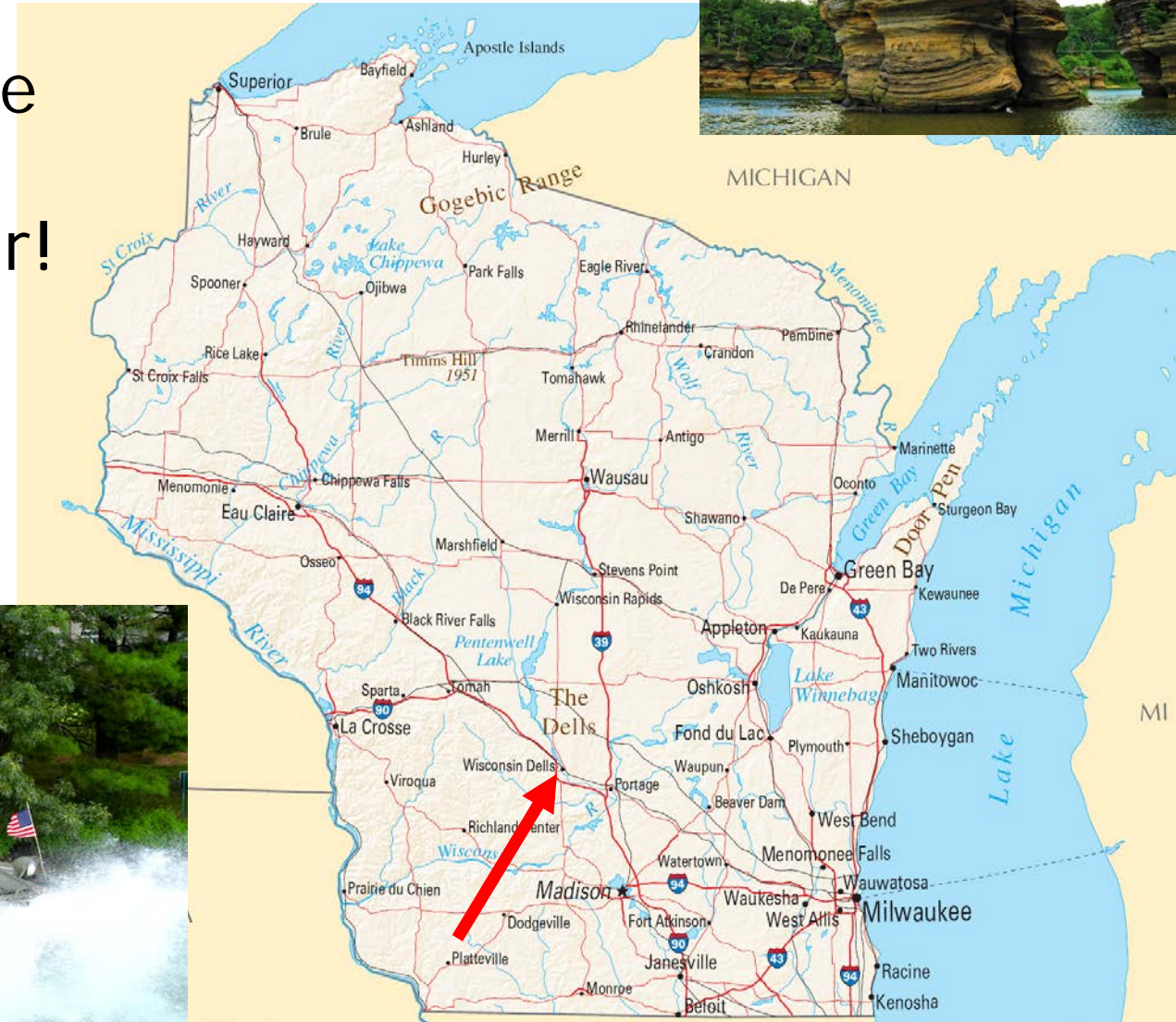


Dryer

Storage

Wisconsin Dells: History & Vitals

- Population: 6000 (including Lake Delton)
- Tourism: >4 million visitors/year!
- Attractions: Water parks and Wisconsin River
- \$1B industry; 15,000 jobs

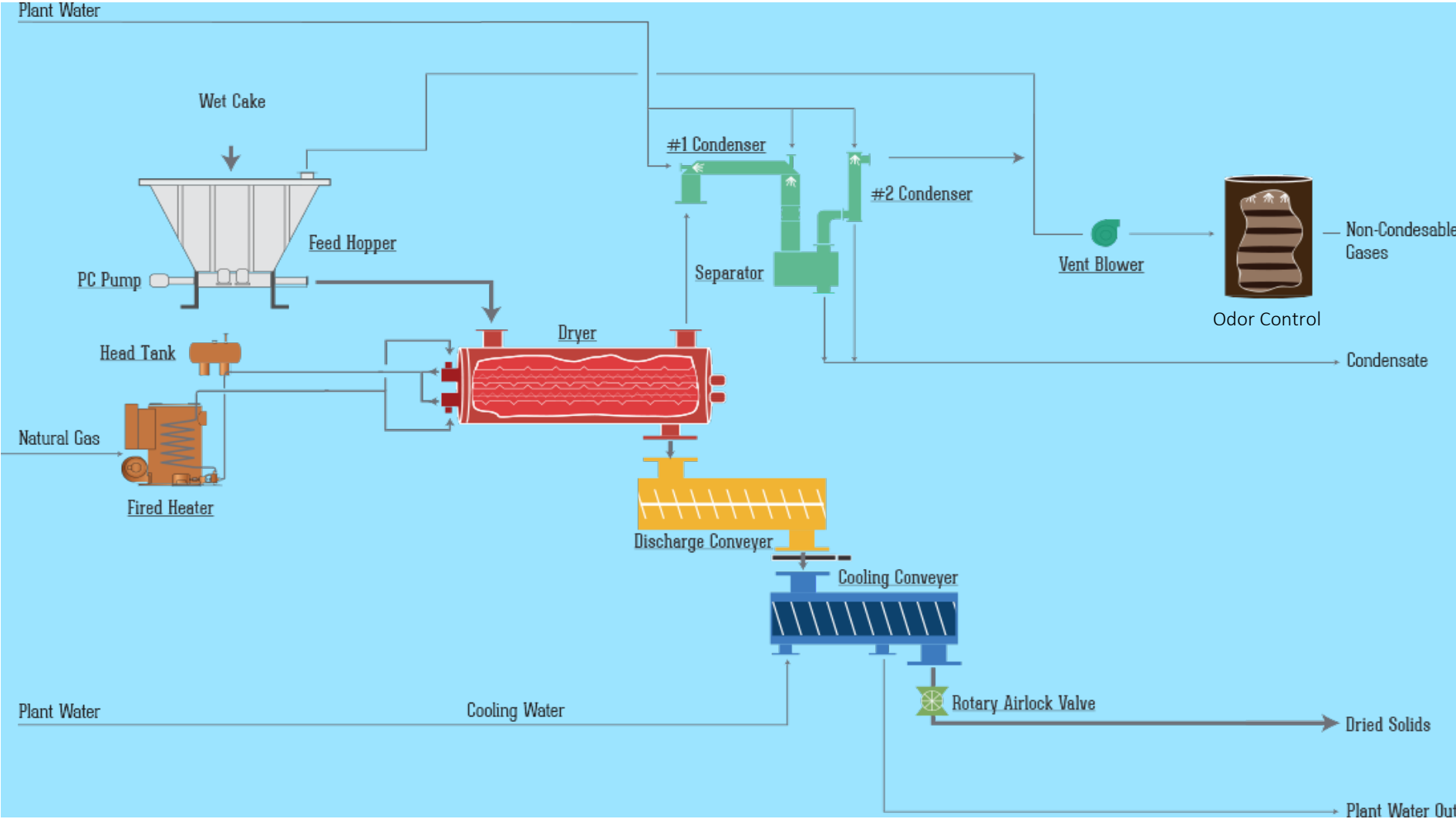


Wisconsin Dells: Water-Treatment Vitals

- Service Area: 6000-75000!
- Throughput: 1.2 - 3 MGD, seasonal
- Staff: 3 Operators; 40-hour week
- BOD 3.7 mg/L, TSS 3.6 mg/L
- Oxidation ditch + aerobic digester
- Biosolids: Class A, >75% solids, land applied
- Weather: Snow, October to April



Wisconsin Dells: Indirect Drying Flow Diagram



Wisconsin Dells: Dryer Selection Criteria

- Seasonal capacity requirements
- Limited staffing
- **Schedule**
- Footprint
- Storage and odor

Wisconsin Dells: Dryer System

Feed hoppers:

- Dual with weigh cells
- Auto switch-over



Dryer:

- Indirect heated
- Onboard condenser



Wisconsin Dells: Dryer System

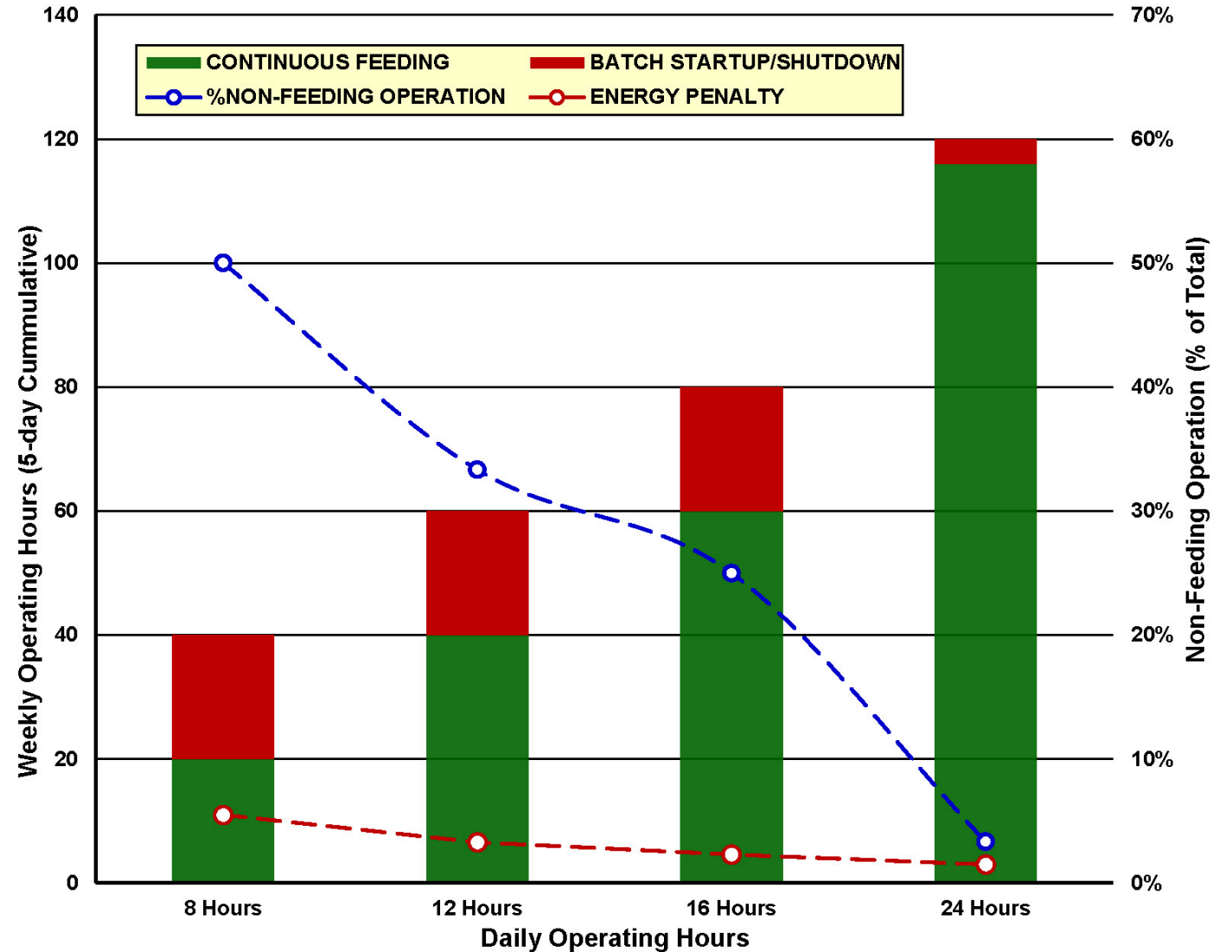
Product loadout:

- 5-station, bag filling
- Auto switch-over



Wisconsin Dells: Availability Versus Schedule

- Typical 5-day schedule
- Impact of dryer system startup and shutdown
 - Non-feeding operation
- Thermal energy penalty



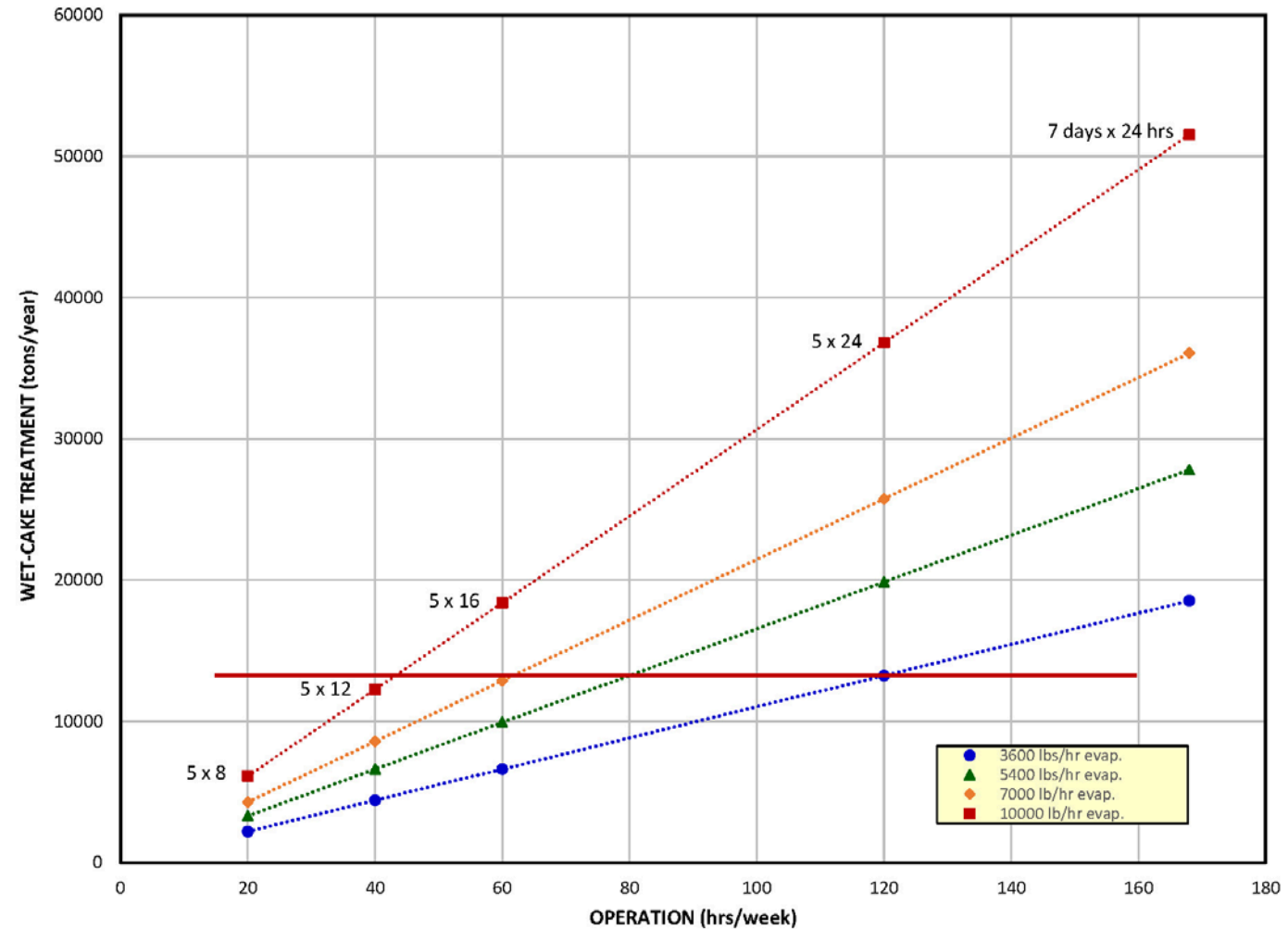
Wisconsin Dells: Example of Capability vs Schedule

Example (hypothetical):

- 13,250 tons wet-cake/year
- Option 1: 5 days x 13-hr batch
 - Yields 45 hours/week feeding
 - 10,000 lb/hr evaporation
- Option 2: 5 days x 24-hr continuous
 - Yields 120 hours/week feeding
 - 3,600 lb/hr evaporation
- \$1.75M capital savings

Q: How to accomplish 24/5?

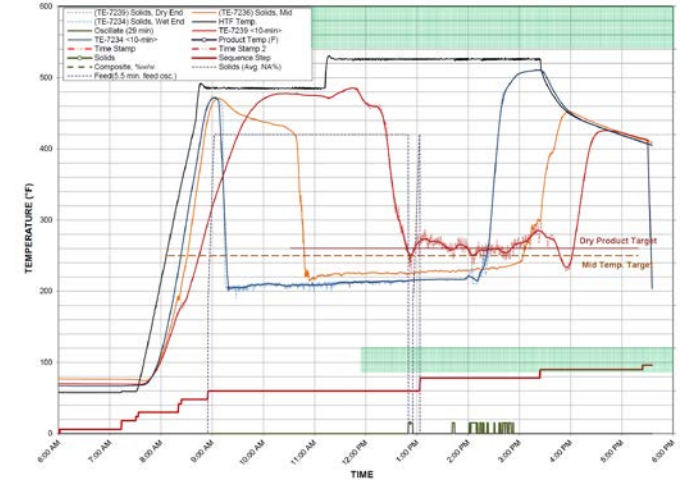
A: Configure for unattended operation!



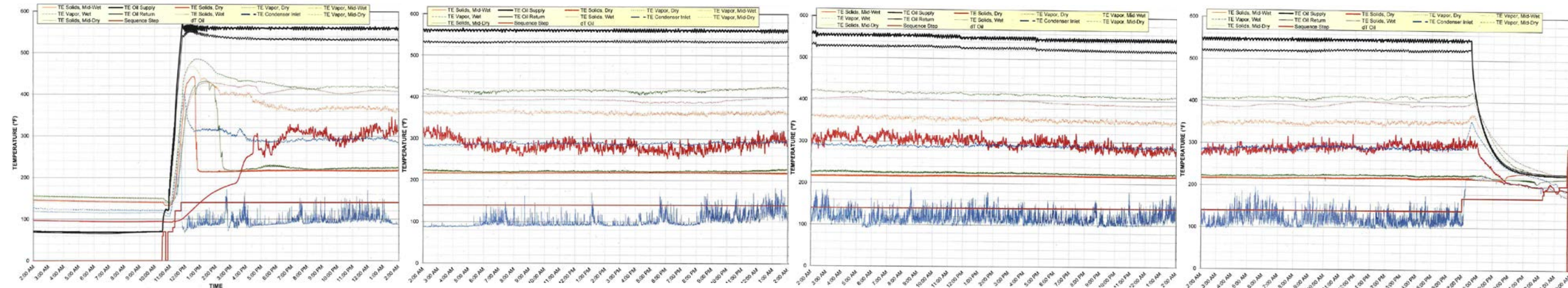
Wisconsin Dell: Batch vs Continuous

- Visualize run (aka feeding) time!
- Compare startup + shutdown time as percent of total
- Steady-state not achieved for short runs

Batch (12 hr/day):



Continuous (24 hr/day):

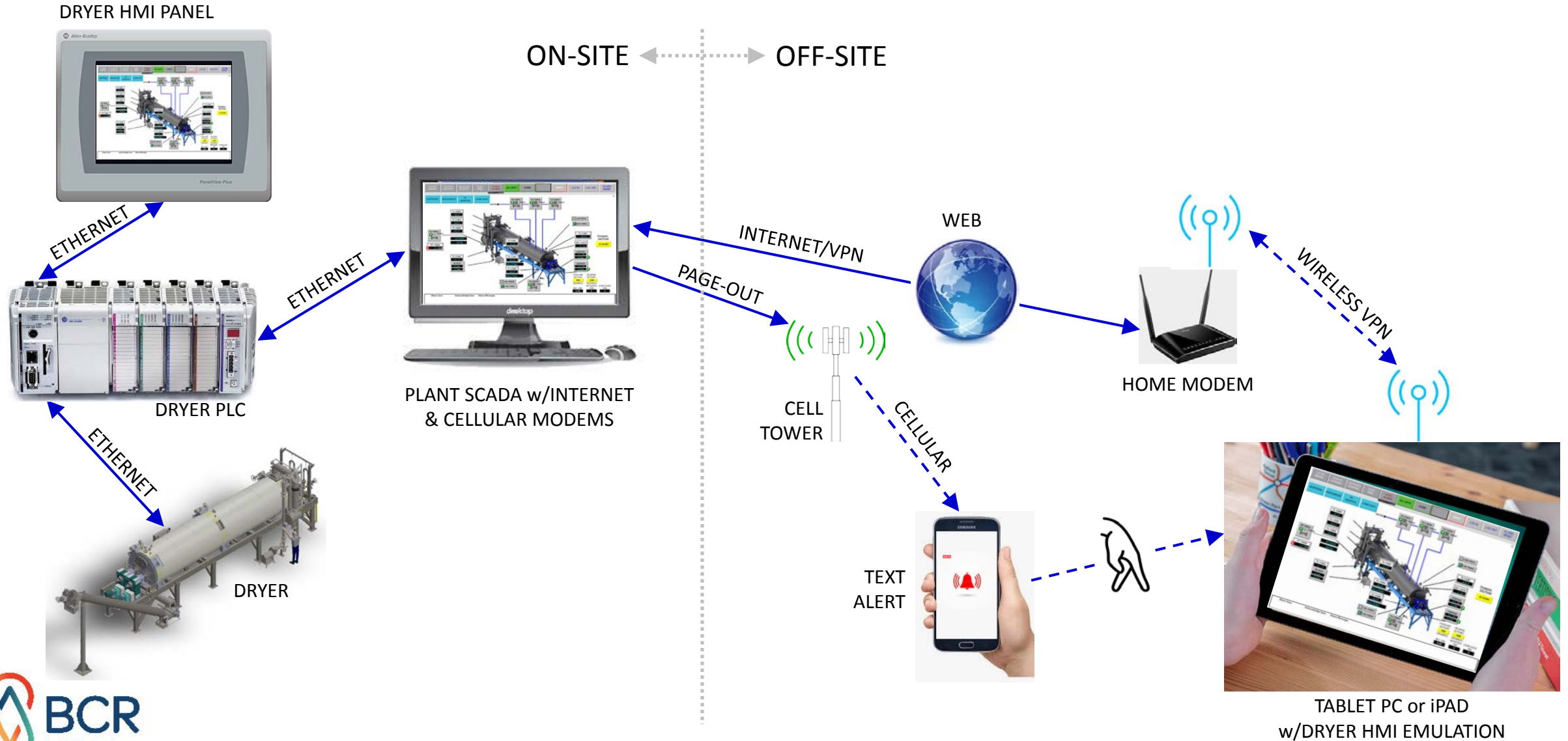


Wisconsin Dells: Design Considerations

Unattended operation requires:

- Safe and reliable dryer operation & controlled shutdown when necessary
- Remote/secure 2-way Internet connection
- Reliable alert page-out protocol
- Matched plant process interfaces
 - Dewatering to drying
 - Large off-hours hopper capacity
 - Large off-hours product storage capacity

Wisconsin Dells: Hardware/Connectivity Requirements



Wisconsin Dells: Response Options

ALERT: The plant is remotely monitored using cellular phones and tablet computer with wireless VPN connection. The tablet computer has full remote emulation of dryer system HMI controls. If a problem occurs, the plant SCADA system pages out an alert.

RESPONSE: Off-hour options include:

- Allow the system to shutdown safely. Correct the issue the following day.
- Use tablet computer to connect and make process adjustments.
- Return and resolve in person.

Wisconsin Dells: Summary of Benefits

Unattended operation yields:

- More throughput/capability during summer months when needed
- Avoided labor costs
- Smaller dryer
- Increased utility efficiency
- Avoided cycling and fewer upsets
- Product quality and consistency



In total, all these add up to significant annual- and capital cost savings

Wisconsin Dells: In Closing

Thank You!

Questions?

Rick Treleven

Regional Sales Manager

rtreleven@bcrinc.com

(262) 483-1363

