GRACE SENSE™

CASE STUDY:

Food and Beverage Manufacturer

The GraceSense™ Hot Spot Monitor's effect on ROI

ABOUT THE CUSTOMER

- A global British-headquartered manufacturer in food and beverage industrial market.
- Turn raw materials like corn, tapioca and oats into ingredients that add taste, texture and nutrients.
- Listed in London Stock Exchange, FTSE 250 Index.
- They produce sweeteners, texturants and wellness ingredients.

BACKGROUND

The Manufacturer performs Preventative Maintenance once every 3 years. They have 4,200 pieces of equipment that they perform IR Thermography inspections on. Over a period of 5 years, they have reduced between 300-400 issues down to 4-5 low level issues.

They have encountered the following challenges with their reactive maintenance approach:

- Repairs done after the failure has occurred resulting in longer downtime.
- Struggling to fix it correctly the first time.
- Have spend approx. $32K per year in third-party thermography inspection contractor costs.
- Systems are loaded up to 90% in normal operation.
- The manufacturing plant uses an ungrounded delta system.

THE PROBLEM:

- 200 Amps Main Breaker Failure.
- Breakers were replaced within 12-16 Months.
- 2100 Amps FLA with 3x400 HP Motor.
- Harmonic caused by 11, 13 and 15th Harmonics.
- Power Quality Issues (Non- Linear Loads).
- Unable to detect the fault with thermography.
- Power Monitor data showed everything was normal.
- Blaming the switchear manufacturer as a result of not uncovering the true issue through thermography inspections.
- Tried changing breaker contacts with silver plating, however, the problem still persisted.

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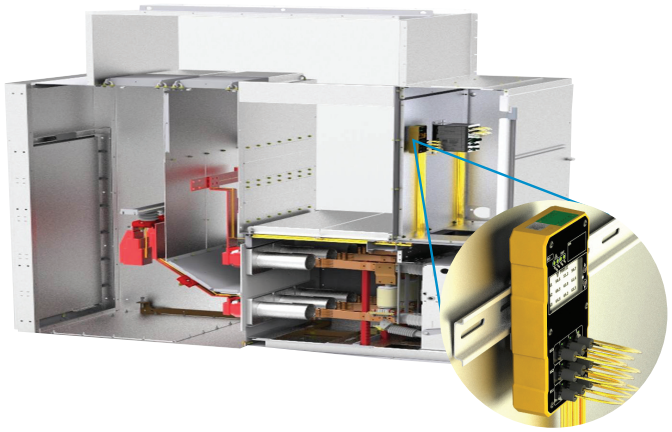
CONTINUED

THE SOLUTION:

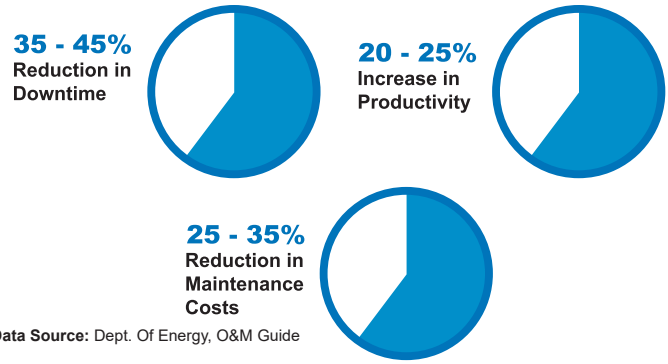
Safety element was very critical while deciding on remote monitoring technology. Thermography Programs through either open-door inspection or using IR viewing windows. Preventative Maintenance is performed once every 3 years. 45- 50 Deg and takes 45 min to 1 hour to cool down (thermal cycling) with delay setting with motor starting sequence Installation of a Hot Spot Monitor provided 5-minute frequency intervals to continuously monitor temperature.



WHY THE HOT SPOT MONITOR IS A BIG DEAL FOR ROI

- The manufacturer's cost of downtime is approx. $178,000 per hour.
- They were able to avoid multiple downtime scenarios after installing a Hot Spot Monitor resulting in an estimated ROI of $500,000.
- MTTR with unplanned shutdown: 4-6 hours.
- MTTR with planned shutdown: 45 min.

The results further indicated that companies implementing predictive maintenance have seen:



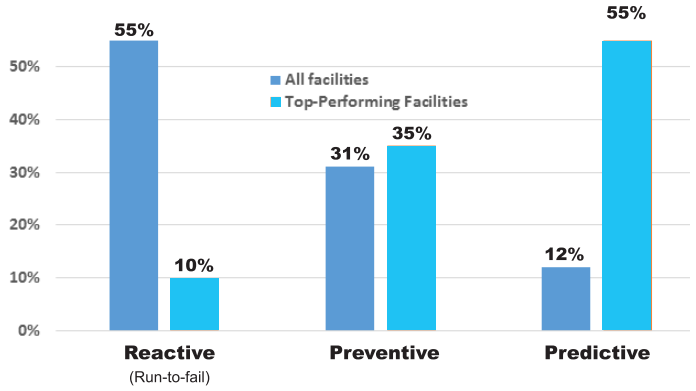
Data Source: Dept. Of Energy, O&M Guide

CRITICAL FACTORS FOR SUCCESS

- Asking for the right information.
- Ability to dissect the drawings and SLDs.
- Understanding customers budget constraints.
- Engaging the switchgear manufacturer or OEM in the Process.
- Integration with their DCS/SCADA.
- Engaging your local distributors.
- Seeking technical support from Grace Technologies.
- Integrating GraceSense™ Maintenance Hub platform with HSM.

Maintenance Type Comparison

Top performing facilities spend more than half of their maintenance budgets on predictive maintenance programs.



CRITICAL FACTORS FOR SUCCESS

- Planned response to potential failures.
- Alarming functions when anomalies are detected.
- Increased uptime and productivity.
- Improved safety culture.

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