

Case Study: Brush Condition Monitoring (BCM)

Brush Condition Monitoring:

Cutsforth's BCM system is an advanced solution designed to optimize the maintenance and performance of turbine generators.

The system delivers automated measurements and brush health analytics directly to the control room. This allows maintenance personnel to detect and determine potential brush failures in advance to better plan downtime effectively. Plants are able to decrease the risk of costly, forced outages and catastrophic events like ring fires.

By integrating BCM into InsightCM™, a multi-measurement platform, operators are able to remotely view critical brush health data. Such data as usable brush length, temperature, and vibration allows personnel to perform maintenance activities based on brush condition rather than a calendar.

The system's historical analytics and trending capabilities further optimize staff utilization and maintenance planning.

CUTSFORTH THE POWER OF INNOVATION											
AC - test generator - test name 2022-06-29 12:41 PDT											
GENERATOR SIDE											
1A	22	0.6	2A	21	0.7	3A	20	0.9	4A	21	0.8
100%			85%			100%			13%		
1B	21	0.6	2B	21	0.7	3B	20	0.6	4B	19	0.7
91%			100%			100%			100%		
1C	21	0.7	2C	19	0.7	3C	21	0.7	4C	21	0.6
82%			49%			-2%			31%		
1D	24	0.7	2D	21	0.6	3D	21	0.7	4D	19	0.9
100%			13%			28%			90%		
						Low Battery			Low Battery		
									Low Battery		
									Low Battery		

BCM touchscreen user interface

The Power of Innovation

Cutsforth™ specializes in developing innovative new technologies and monitoring systems empowering data-driven decisions to improve availability, reliability, and operating costs.

BCM significantly enhances a plant's maintenance efficiency with:

- Real-time data collection
- Automated alerts
- Historical analytics
- Reduced operating expenses
- Remote monitoring

The solution's ability to provide accurate real-time data and predictive analytics leads to more efficient maintenance practices, reduced costs, and improved plant safety.

Case Study: Southeast Power Generation Plant

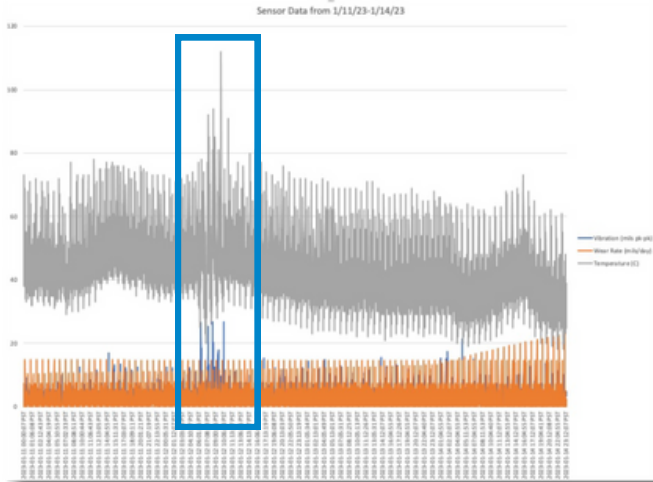
Challenge:

The customer, which had two 7F units and a D11, reported the brush health sensors on their steam turbine were melted. The side of several brush holders showed a splatter pattern indicative of water on collector rings, as seen in the image below.



Brush holder showing water splatter pattern

BCM Case Study



Screenshot showing time frame of spikes in data

Key Findings:

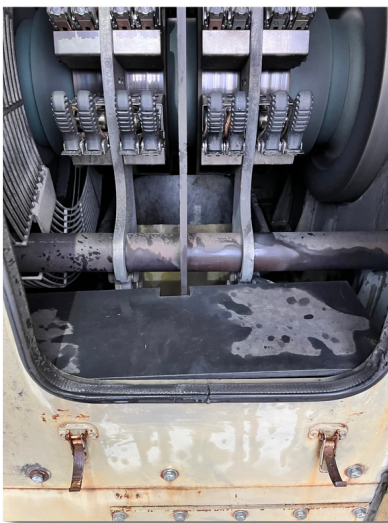
The plant sent Cutsforth historical data logs from their BCM system. The data showed a short time frame with extremely high temperatures on some brushes, and extremely low temperatures on others. There were also corresponding elevated vibration readings across the brush rigging. This was determined to be the most likely point at which the melting of the sensors occurred. Thunderstorms were reported in the area during this time frame.

Upon inspection of the damaged brushes and sensors, it was observed that the brush springs were permanently deformed, and the plastic spacers (made from high-temperature plastic) on the back of the brushes were also melted. This indicated temperatures in excess of 700°F.



Melted sensors on the brushes

Water intrusion was found to be the cause



Resolution:

Water intrusion was determined to be the likely cause. Water on the collector rings washed away lubricating carbon film on the ring surface, thus lessening the quality of electrical connection between some brushes and the ring surface. The decreased current flow through these brushes resulted in lower temperature readings, and the increased friction due to lack of lubricating film resulted in higher vibrations. Other brushes not affected by the water contamination reported higher temperatures due to increased current flow (selective action).

The customer inspected the unit's exciter and discovered significant signs of water inside the housing. Plant personnel investigated gaskets on all openings of the exciter to find the root cause. Using Brush Condition Monitoring, the plant was able to identify and determine the issue before a major failure occurred.