

## CASE STUDY

# Transformer Health Management

Partner:  
New York Power Authority  
(NYPA)

Sites:  
Robert Moses Niagara  
Power Plant & Blenheim-  
Gilboa Power Plant

Product Name:  
mNTCS  
(mPrest NYPA Transformer  
Control System)



*“NYPA’s partnership with mPrest has proven to be a highly successful relationship. The system has already proven in its test stage to be able to accurately predict transformer health beyond that available in the industry”*

Alan Ettlinger, Director, Research, Technology Development & Innovation. New York Power Authority

## The challenges in coping with multiple vendors and standards

Asset Health Management poses a long-standing challenge for power utilities, most of which still operate legacy systems that are difficult to properly and optimally maintain. In many cases this is due to a lack of effective real-time monitoring and diagnostics solutions that can **cover diverse multiple standards and data points**, for accurately predicting the transformers’ future health condition. Consequently, mission critical assets may fail, potentially causing life threatening situations, outages, heavy damages and replacement costs that can amount to tens of millions of dollars.

## NYPA’s energy infrastructure improvement plan

The New York Power Authority (NYPA) has strategically decided to invest in enhancing performance and improving reliability and cost-effectiveness of its electricity generation assets and transmission network. The **ability to accurately predict potential failures** – through better diagnostics and prognosis – may be the most effective solution for reducing unplanned downtime, maintenance costs and operational risks. Consequently, NYPA decided to cooperate with mPrest on developing the mNTCS product.

## NYPA power transformers – Case in point

Representing among the largest capital equipment investments for NYPA, power transformers play a critical role in generating a reliable flow of energy. Asset management and enhanced resiliency are vital to electric power facilities, and require the close monitoring of electricity flow and a comprehensive analysis of past performance. Such were the cases at the Blenheim-Gilboa and Robert Moses Niagara power plants when the transformers failed on August 26th, 2012 and March 19th, 2014, respectively.



## Installation of mNTCS at power plants

In response to the 2012 and 2014 failures, NYPA partnered with mPrest to jointly develop a novel transformer monitoring and diagnostics system that could potentially prevent the reoccurrence of such issues. The mPrest Transformer Control System (mNTCS) analyzed NYPA’s Niagara and Blenheim-Gilboa power plants data in May and September 2016, respectively.

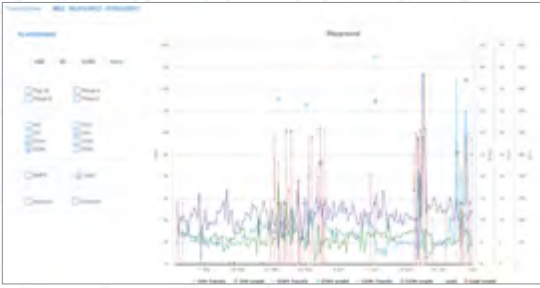
## mPrest’s mNTCS system-of-systems Platform

mNTCS “System of Systems” is a monitoring and diagnostics system for transformer health management. mNTCS excels in connecting data from various transformers and sensor data related to the transformers’ health and operational condition. The platform operates across multi-vendor assets and sensors, analyzing the data using all known methods and evolving standards. mNTCS delivers a complete real-time picture of the transformers’ health condition, and is NERC/CIP compliant. Using advanced anomaly-detection algorithms that rely on real-time and historical data, combined with external lab reports data, machine learning and an advanced rules engine, mNTCS accurately predicts transformer health by detecting “subthreshold-based” anomalies. Thus detecting failures well before they occur.

Photo: New York Power Authority



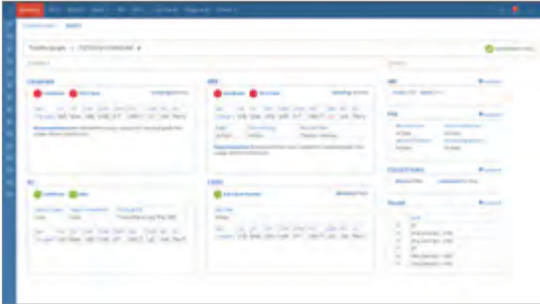
Abnormal samples detected by algorithms



High severity alert occurred on July 2nd

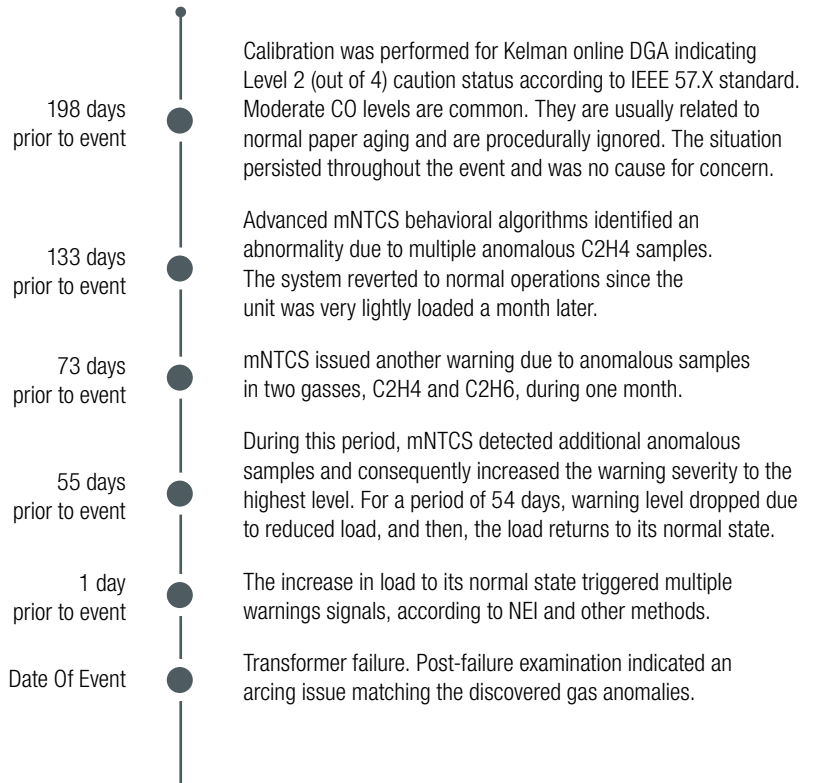


Analytic summary of current transformer status



## Post-failure examination

mNTCS installation included connections to Transfix sensors, SCADA & Maximo maintenance systems, as well as historical DGA samples. mNTCS analyzed historical data in order to identify and learn from the events which led to the 2012 failure:



# mNTCS offers Unrivaled Predictive Analytics and Prognoses for Superior Disaster Prevention

## Predictive power for disaster prevention beyond compare

mNTCS is able to predict future failures, as it goes beyond “threshold analysis” used by conventional solutions on the market. **Leveraging mNTCS’ subthreshold advanced algorithms, mPrest was able to detect multiple behavioral warning signs in advance – even when gas levels were below the normal warning threshold.** The failure may have been avoided, had mNTCS been installed earlier.

## Unmatched diagnostics for prioritized fleet maintenance

Proper asset management requires having a comprehensive fleet view of the assets, which enables the prioritization of fleet maintenance. **Leveraging mPrest’s proprietary methodology and anomaly-detection algorithms, mNTCS features the unique capability to predict transformers’ future health condition.** This allows utilities to perform a more optimized, timely fleet maintenance planning process through proper fleet ranking. Such proactive and preventive maintenance measures help ensure continuous operations at dramatically reduced costs and risks.

## mNTCS features & capabilities

- Real-time analytics for enabling predictive and condition-based maintenance (CBM)
- Subthreshold condition assessment for effective maintenance prioritization
- Anomaly detection around recurrence, magnitude and cross dependencies of multiple KPIs, leading to a more accurate analysis with fewer false alarms
- Single consolidated database for superior analytics
- Compatibility with existing and future sensors
- Compatibility with EPRI PTX transformer analytics engine
- Vendor agnostic compatibility

