

# **Empowering Reliability with Smart Health Monitoring System for CESC's Power Transformers**

CESC Limited stands for reliability and consistency in creating a delightful Customer experience. Throughout our journey of 120+ years, we have built a strong brand identity of dependability pivoted around our core value – ‘Customer First’. We have unswervingly harvested technology to meet changing Consumer expectations over the years and are constantly working on new-age expertise to maintain the satisfaction and trust of our Customers.

Committed to maintaining the highest levels of service delivery as an overarching objective, we obtained our first patent from the Government of India, for the project ‘Smart Health Monitoring System for Transformers in Electric Power Distribution Network’ in August 2023.

Transformers are used in electrical distribution and transmission industries to reduce the voltage at the primary level and provide the required voltage to the Consumers for daily usage and are thus the most crucial equipment in the distribution of power. The monitoring and control of distribution transformers is an important procedure for the smooth functioning of the electrical network. The efficiency of transformers is often significantly reduced over a period of time if they are subjected to overloading, ineffective cooling, or heating. This can result in unexpected failures and loss of supply to a large number of Customers. As a large number of transformers are distributed over a wide area in an electrical system, it's difficult to measure the condition of every single transformer manually.

In this age of digitalization, the Internet of Things (IoT) can help utility service providers to optimally use transformers and identify problems before any failure occurs. The IOT-based solution for monitoring and controlling distribution transformers is quite easy and effective compared to manual monitoring.

CESC Limited has designed a framework that encompasses an in-house developed, state-of-the-art, fully integrated, near real-time manageability solution for the health monitoring of the Power Transformers. CESC's IOT-based Smart Transformer Monitoring System is proficient in acquiring data from different ‘makes sensors’ to dynamically measure and monitor important health indicators of transformers, such as temperature, humidity, and enclosure door status, thus breaking free from the constraints of various available proprietary OEM solutions. These sensors are strategically installed on Distribution Transformers and Power Transformers at different locations. This system excels in integrating these diverse sensors to provide customized data visualization, enhancing situational awareness and enabling predictive measures for safeguarding the health of transformers, enabling us to aim a notch higher to provide the best services to our Customers. This system can also gather real-time data to prevent potential failures, enhance safety, mitigate fire risks, and extend the overall lifespan of distribution assets, which was achieved through the use of advanced Industrial Internet of Things (IIoT) sensors from various manufacturers.

CESC has also developed a Graphical User Interface (GUI) system to monitor Distribution Transformers fitted with IOT devices and receive visual alerts for promoting quick responses to potential issues. Currently, approximately 75 Distribution Transformers and 52 Power Transformers are integrated into this innovative system.

As CESC embraces this empowerment to predict maintenance needs and prevent faults, our distribution network is poised to become more resilient, reducing downtime, enhancing energy efficiency, and ultimately contributing to a smarter, more future-ready urban landscape.