

The Siemens logo is displayed in a bold, teal, sans-serif font within a white rectangular box. The background of the entire page is a photograph of a high-voltage electrical substation with several tall metal pylons and power lines stretching across a green field under a blue sky with scattered white clouds.

# The next step into the future of substations

The digitalization masterplan for ISA CTEEP

[siemens.com/mac-ioe](https://www.siemens.com/mac-ioe)

**How can digitalization help make decisions on operation, maintenance and renewal of assets to ensure security and increase the reliability of a system?**

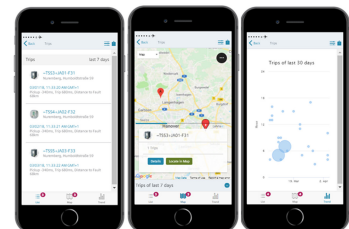
The Brazilian transmission system operator ISA CTEEP wants to bring innovation to the existing transmission grid and explore the potential for data that is already available in SCADA. ISA CTEEP joined with Siemens MindSphere Application Center in Brazil to face their challenges and experiment with the benefits of the Internet of Energy.

To experiment with new technologies, ISA CTEEP and Siemens installed sensors and equipment to run pilots in two different substations. Using data analytics, it is possible to identify the value of unused SCADA data, uncover new insights and identify appropriate applications. This concept reduces overload and the effort needed to check the sensors. This results in less maintenance and longer life cycles for transformers.

This concept also saves more than 50 percent of unnecessary data. ISA CTEEP is a frontrunner in innovating the transmission grid thanks to the implementation of the first SICAM Grid Edge and SIP Dashboard worldwide. This has led to reduced computational process costs.

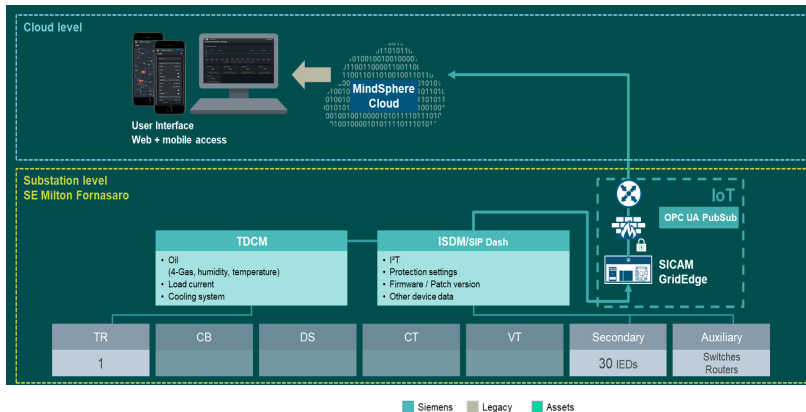
**"[...] we will use more and better the existing data and others that will be implanted by sensors. With that, the expectation is to move forward with the Smart SCADA theme, which has total synergy with the analytics proposed by Siemens in its MindSphere and in the application of Asset Performance Management (APM), bringing robustness to our asset management processes."**

Daniel Barbin, Coordinator of the Commissioning and Protection area of ISA CTEEP



Insights into SIPROTEC Dashboard

# ISA CTEEP and Siemens: Solutions for unique use cases in two different substations



## A glimpse of the situation at Milton Fornasaro

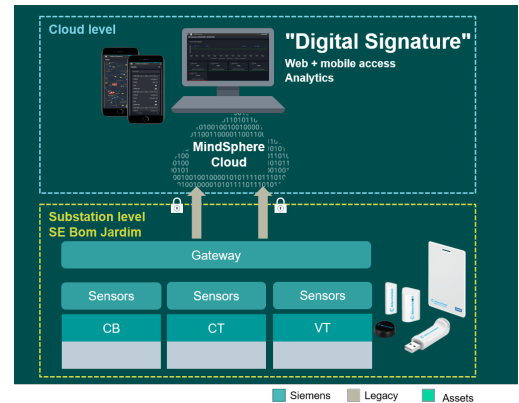
The goal for the substation Milton Fornasaro is to change the maintenance mindset from time-based to conditional operation-based maintenance. Also, to ensure faster reaction in case of faults.

To realize the idea, a grid edge gateway was combined with SIPROTEC Dashboard V2 to provide maintenance related data to ISA CTEEP. The collected data from the SIPROTEC device is sent via the grid edge to the SIPROTEC Dashboard, where the information is monitored. Now it is easier and faster to find the right moment to service the equipment in the field.

The substation Milton Fornasaro now benefits from SIPROTEC Dashboard, which collects fault records directly and enables the ability to act faster. This gives transparency to the control center, which can reconnect the line of transformers in case it is not a permanent fault.

## A glimpse of the situation at Bom Jardim

The focus for the second substation Bom Jardim is to do more condition-based maintenance. Another focus point is faster reaction to fault records. The solution here is to install IoT sensors in current and voltage transformers as well as in circuit breakers.



This creates a digital signature, which shows the baseline behavior of the devices. Monitoring this baseline helps ISA CTEEP trigger maintenance colleagues to take action when there are changes in the expected behavior pattern. Furthermore, additional variables like temperature, vibration and magnetic field are analyzed and combined with traditional variables such as current, voltage and power.

With this setup more condition-based maintenance is possible and the substation at Bom Jardim now has the ability to monitor equipment and assets, which normally would have been overlooked in the supervision of the substation.



**Siemens 2020**  
Smart Infrastructure  
Digital Grid  
Humboldtstrasse 59  
91459 Nuremberg  
Germany

**For the U.S., published by**  
Siemens Industry Inc.  
100 Technology Drive  
Alpharetta, GA 30005  
United States