



BACSOFT CASE STUDY ISRAEL ELECTRIC CORPORATION



ABOUT IEC

The Israel Electric Corporation (IEC) is the main supplier of electrical power in Israel. IEC builds, maintains and operates power generation stations and sub-stations, as well as transmission and distribution networks. Founded in 1923 as the Jaffa Electric Company, IEC is one of the largest industrial companies in Israel, owning and operating an extensive nationwide power distribution network fed by 17 power station sites (including 5 major thermal power stations) with an aggregate installed generating capacity of 13,384 MW.

THE CHALLENGE PREVENT TRANSFORMER THEFT

Generating electricity is a complex process. The final product cannot be stored - it is generated and supplied in real-time and subject to demand at any moment. Every time a customer connects or disconnects from the system, the system must adapt seamlessly and generate more or less electricity. So when transformers are stolen or vandalized, it upsets an entire system.

Because of the valuable copper they contain, transformers in isolated areas are highly vulnerable to theft. In order to remove the parts, the vandals cut off the electricity, disrupting power delivery to the vicinity. Emergency teams must be sent in to restore the power and repair the damage. The repair is expensive and until it is complete, local residents often have to endure power outages.

< THE CHALLENGE

Since vandals and thieves must first cut off the power in order to steal the parts, IEC realized that by monitoring the power at the transformer and alerting to sudden drops, they could send a patrol car and stop the theft at the earliest stages of the incident. At the same time, they decided to monitor the temperature of the transformer to send an alert for excessive heating, which would indicate that electricity was being stolen.

CONNECTING ISOLATED, WIDELY DISPERSED INFRASTRUCTURE

Because the transformers that are at the highest risk for vandalism are in isolated areas and dispersed throughout the country, IEC needed an M2M connectivity solution that would be easy to install and require very little maintenance. It needed to be small enough to sit on an electrical pole and able to operate reliably on a battery when the power was cut.

To enable rapid response, the solution had to be able to communicate through multiple channels. Most importantly, real-time alerts had to be sent to the patrols in the field, to enable a rapid response. Local management needed the ability to check up on status via a web app on their smartphones or tablets at any time. And all of the power and temperature data that was collected had to be transmitted to the control room and integrated seamlessly with their SCADA systems.

Last but not least, IEC needed a secure solution that would pass national standards for critical infrastructure. IEC looked for one end-to-end solution that could provide everything they needed – from the cellular connectivity to secure data collection and end-user applications.

THE SOLUTION BACSOFT IOT PLATFORM

To provide remote monitoring and alerting for their electrical transformers, IEC chose the Bacsoft IoT platform. The platform includes:

M2M Communications

Bacsoft Smart Communications Controllers are installed right on the electrical pole near each transformer and transmit data about the power supply and temperature to the cloud along with GPS data for responders.

IoT Cloud

The Bacsoft IoT Cloud handles all aspects of communications, application execution, data storage, security and auditing in a high-availability cloud platform. All of the power and temperature data is collected and securely stored here for processing.

Bacsoft Application Builder

Using the Application Builder, Bacsoft created the web application for managers, integrated the data into their SCADA system, and created alerts for the field teams, leveraging the ability to define different alerts for each team.

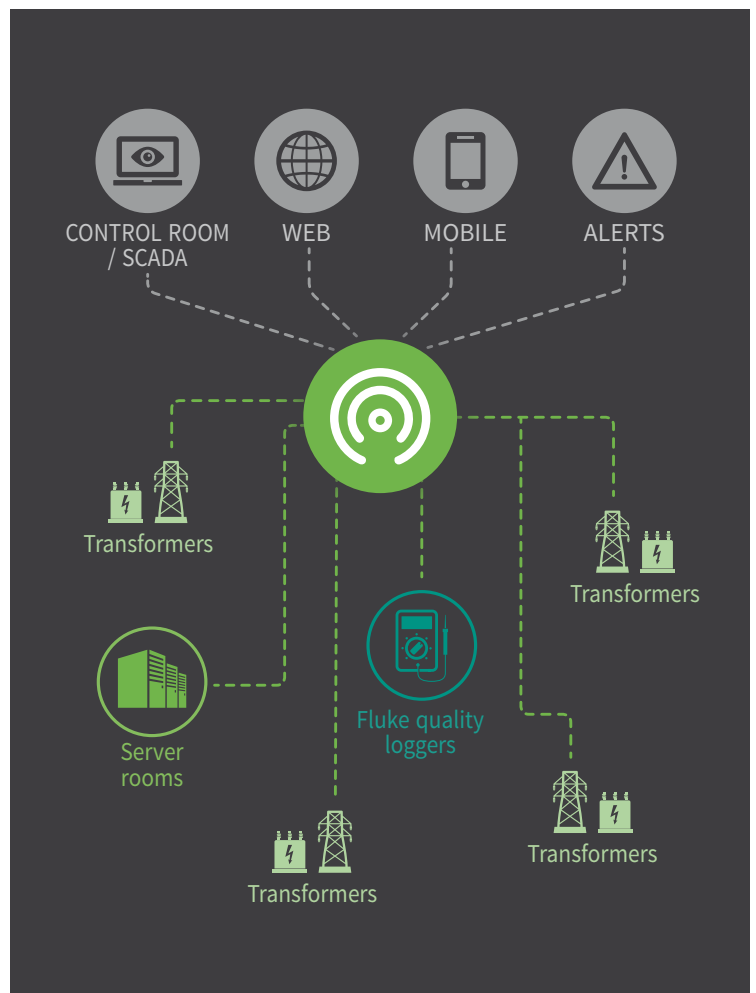
The Smart Communications Controllers are plug-and-play units that connect seamlessly to the power and temperature sensors. The process is simple and takes no more than 2 hours – within a month, the initial roll-out to about 100 high-risk sites had been completed. After the initial deployment, the IEC team took over the installation and continues to set up new units on their transformers as needed.



SECURITY FOR CRITICAL INFRASTRUCTURE

The Bacsoft solution was designed to meet all of IEC's rigorous security standards. The servers are installed in IEC's private cloud and the controllers transmit data over encrypted channels using a private cellular network.

The solution is approved by NISA, Israel's National Information Security Authority, which sets the highest security levels required for critical M2M systems.



"WITHIN A FEW WEEKS, THE BACSOFT SOLUTION DETECTED A TRANSFORMER THEFT ATTEMPT AND WE WERE ABLE TO STOP IT. BY PREVENTING THAT ONE THEFT, THE ENTIRE BACSOFT SYSTEM PAID FOR ITSELF."

Communications Engineer,
Israel Electric Corporation

EXPANDED VISIBILITY AND MANAGEMENT

Owing to the success of the transformer project, IEC decided to expand their remote visibility and control to quality metering stations that are deployed in geographical areas or at strategic customer sites where a high quality of service is required. At these sites, they had installed Fluke 1745 Power Quality Loggers to perform power supply measurements and data logging, but they were not connected to the Internet of Things. To collect the data, IEC was sending a team of two people to unlock the facility, connect a computer to the Fluke logger and download the data.

Since the Fluke logger did not have a remote communications protocol, Bacsoft wrote a custom protocol to extract the data and transmit it using a Smart Communications Controller at each station. The data was sent to the cloud where it could be analyzed by IEC and forwarded to their SCADA systems.

The IEC team also started to monitor temperature, humidity and smoke detectors in their server rooms. Since Bacsoft is so easy to use, they installed the entire system on their own, connecting the Bacsoft Smart Communications Controllers, integrating the new data points into their SCADA system, and defining the alerts they needed using the Application Builder.

"WE'VE BEEN USING BACSOFT FOR OVER 5 YEARS AND IT IS HIGHLY RELIABLE. IT REQUIRES ALMOST NO MAINTENANCE, AND IT IS SO EASY TO USE THAT WE HAVE BEEN ABLE TO EXPAND THE SYSTEM OURSELVES AS NEW NEEDS ARISE." Power Quality Engineer

BACSOFT BENEFITS FOR IEC

- DRAMATIC REDUCTION IN TRANSFORMER AND ELECTRICITY THEFT
- FEWER SERVICE DISRUPTIONS DUE TO VANDALISM
- FASTER, LESS COSTLY INCIDENT RESPONSE WITH EARLY WARNING
- EFFICIENT AND COST-EFFECTIVE REMOTE DATA COLLECTION AND MONITORING
- REMOTE VISIBILITY FOR COMPANY MANAGEMENT FOR BETTER DECISION MAKING
- SECURE COMMUNICATIONS AND DATA STORAGE
- RAPID DEPLOYMENT – ONLY 2 HOURS PER SITE
- EASY TO USE, CONFIGURE AND EXPAND
- RELIABLE, SCALABLE CELLULAR M2M COMMUNICATIONS FOR OVER 150 SITES
- REAL-TIME, CONFIGURABLE ALARMS AND ALERTS
- SIMPLE SCADA INTEGRATION
- LOW TOTAL COST OF OWNERSHIP

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