

Case Study

Bottled Water Company Implements Large Format
Polymer Windows



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Overview:

One of the North America's leading bottled water companies dedicated to providing customers with healthy hydration options and equally committed to keeping their people safe, recently approached IRISS for assistance in optimizing their asset life cycles. Their primary goal was defining cost-effective, consistent maintenance processes by adopting the technologies to support and sustain these processes throughout the U.S. and Canada. As part of this multisite initiative, one of IRISS' distributor partners, Scott Thornton of DTM Consulting Services, was engaged to provide recommendations for placement, sizing, and type of IR windows to be installed at their Ontario, Canada facility. After initial site survey, DTM recommended the CAP-CT series in various sizes to complete this project. CAP-CT series is a NEMA 4 / IP65 rated IR window and ideal for indoor applications. Standard sizes are 4, 6, 12, 18, and 24 inches plus custom sizes are available including optional partial discharge ports.



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Analysis of Inspection Program

The company developed a reliability and maintenance policy that includes a 3-5 year improvement plan. This policy was then communicated to all employees. The company outlined all essential reliability and maintenance elements, their key performance indicators, why these are important and the importance of a Reliability Centered Maintenance (RCM) and Reliability Based Maintenance (RBM) program for overall plant safety.

The company had done the necessary research and determined that they would retrofit using the IRISS transparent patented polymer Infrared Windows as safer method of conducting standards-compliant inspections. It was decided by the reliability team to implement the large format infrared polymer windows for Main Switchgear Bus connections; Main Breaker connections and Fused Switches to help eliminate the hazard of live work by finding hot spots through the IR windows.

As a result, more frequent inspections of energized equipment could be performed by retrofitting with Infrared Windows for routine inspections. The closed panel inspections with the windows in place did not require the elevated levels of Personal Protective Equipment (PPE) mandated in NFPA 70E, thus reducing time and maintenance costs. Thermal imaging was not new to the maintenance and reliability team as they had previously retrofitted some equipment with traditional round calcium fluoride windows. However, it was determined that a transparent polymer Infrared Window available in various large formatted sizes would provide both visual and thermal inspection with fewer units needing to be installed.

The IRISS patented polymer based infrared windows are unaffected by the environmental and mechanical stresses ensuring that the temperature data collected through the IRISS IR window is accurate and reliable for the whole life of the installation. Crystal based IR windows are both highly fragile and hygroscopic (even when coated) causing degradation of the transmission over time and temperature reading errors. Polymer based IR windows are far more able to resist the mechanical stresses applied to IR windows that are fitted to electrical distribution equipment. IRISS industrial grade IR windows meet mandatory impact and load testing requirements of UL, CSA, IEEE and IEC. Many of these tests cannot be passed by any crystal based IR window.

With the infrared windows installed, there was no need to remove panels or wear increased levels of PPE. Inspections could now be performed more often and on electrical equipment that had previously been considered “uninspectable” due to high levels of Arc Flash incident energy.

The installation process proceeded smoothly and included:

- Preplanning to identify the equipment and obtain approval to shut down
- De-energizing the equipment with two electricians to make sure it was safely isolated, locked out and tagged out
- Once de-energized, the two electricians removed all covers on the equipment in question
- The IR windows were installed using supplied drill/cut templates in the appropriate location and the covers were replaced



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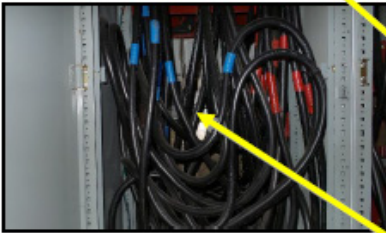
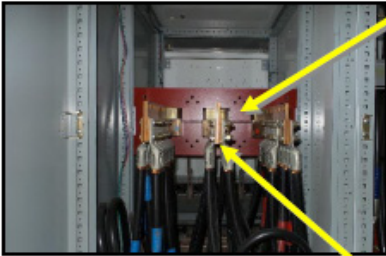
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- Appropriate PPE was put on by the electricians and the equipment was reenergized
- Together with operations, the electricians confirmed the equipment was operating at normal load levels and allowed sufficient time for the equipment to become thermally stable
- Thermographer electrician then performed the infrared inspection on the equipment to secure baseline temperature data
- Personnel completed the inspection by taking notes of any problems discovered

Installation Requirements:

Main Breaker Buss	CAP-CT-24
Main Breaker Load	CAP-CT-24
Fused Breakers	CAP-CT-24

Main Breaker Buss - Cabinet A



SWGR 96-SWG-01

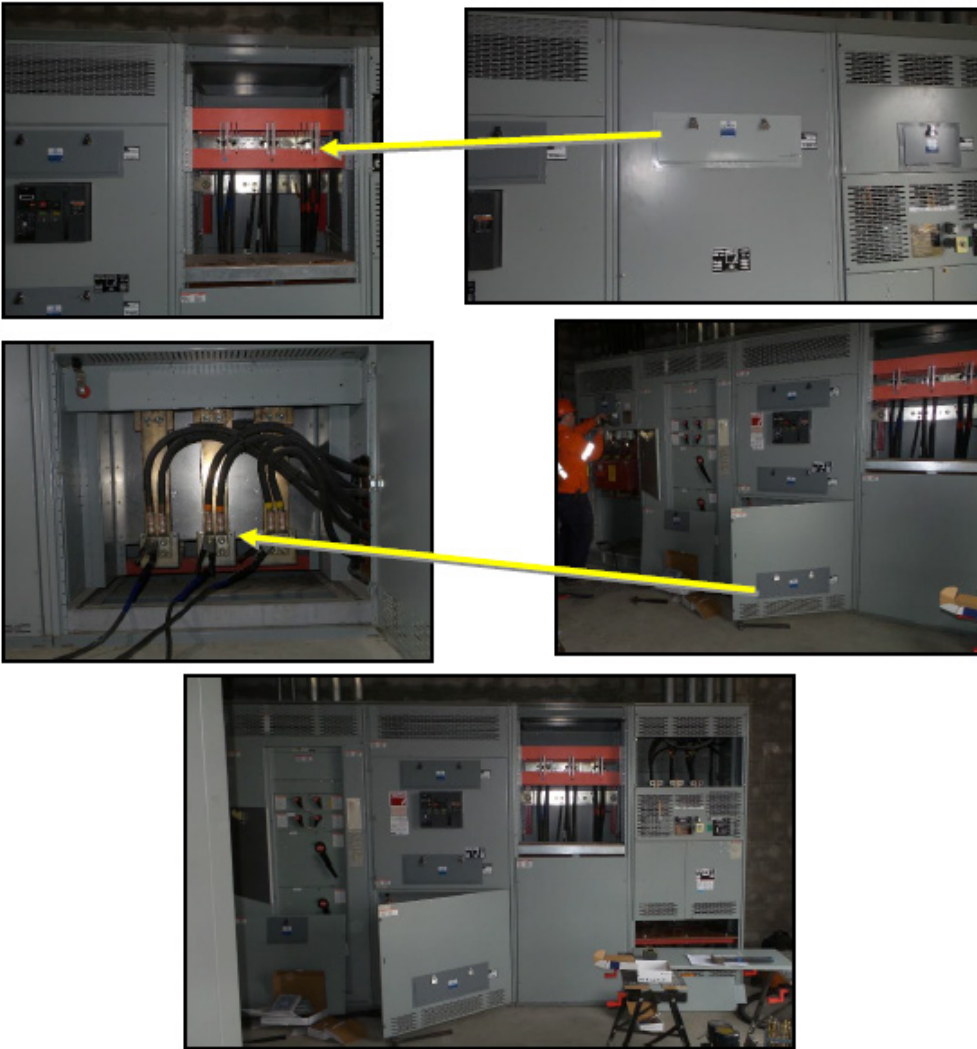
Cabinet A, B, C



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Installation Requirements:
Incoming line connections CAP-CT-24
Main Breaker CAP-CT-24



Results

The bottled water company has recognized a huge savings in time and money with the implementation of IRISS patented transparent polymer infrared windows into their condition based monitoring program. The use of polymer infrared windows allows more convenient and frequent inspections resulting the ability to catch and fix potential problems long before they turn into unexpected outages. In this way, the bottled water locations will see increased Mean Time Between Failure (MTBF) on their critical electrical infrastructure. Most large facilities with large distribution power systems find that their insurance provider requires annual infrared (IR) inspections of their electrical systems. This mandate is a direct result of verbiage found in NFPA 70B but retrofitting IR windows enables the facility to perform these inspections in a fraction of the time and in a much safer way.

Based on the results at the first sites, the bottled water company has now proceeded with implementation of the IRISS IR window solutions at twenty-nine (29) of their sites around North America.



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