CGI Power Transformer Manager

## Real-time condition insight that extends transformer life and maximises capacity

At CGI we help Distribution System Operators understand true transformer capacity and extend asset life. Our Power Transformer Manager provides real-time thermal insight, predictive cooling and dynamic rating. It improves utilisation of existing infrastructure and supports safe emergency loading, without increasing ageing.

Distribution System Operator (DSO) challenges:

DSOs face growing pressure to defer capital spend and increase transformer performance. Engineers tell us they need to:

- Create CapEx efficiency through relief or reallocation
- Extend transformer life by avoiding thermal stress
- Use true transformer capacity to improve utilisation
- Defer costly substation augmentations
- Deploy a practical monitoring solution that works across all transformer sizes, not just the largest assets

Our solution addresses each of these challenges through accurate thermal modelling, real-time condition data and operational decision support.
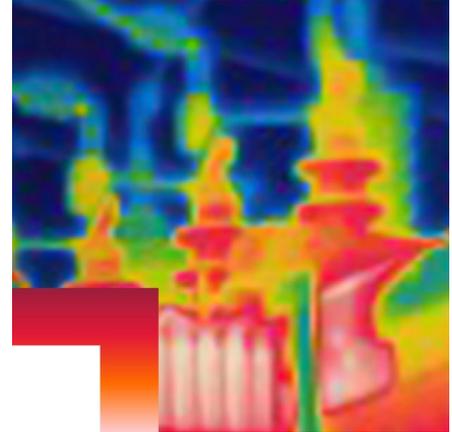
BENEFITS

Extend transformer life

- Accurate thermal prediction and early cooling reduces insulation ageing. This helps extend asset life and avoids early replacement cycles.

Maximise existing capacity

- Dynamic rating lets operators use true capacity, improving live loading efficiency and enabling safe emergency operation without risk.

Reduce CapEx and avoid unnecessary upgrades

- Better utilisation and improved lifecycle management help DSOs defer costly augmentations and redirect investment to higher-value priorities.

Deploy at scale and at low cost

- Our low-cost edge compute RTU solves the cost barriers of traditional condition monitoring. It extends the same insight to smaller transformers and substations.

Integrate with existing systems

- The application works with existing SCADA and RTU infrastructure. It requires only ambient temperature, load and tap data and supports varied transformer models.

Key features

1. Dynamic and predictive rating

We calculate live and forecast hotspot temperatures using IEC 60076-7 dynamic thermal modelling. This gives operators confidence to load transformers beyond static nameplate ratings when required, with no added risk.

2. Early, actionable insight

Operators see time-to-over-temperature, required load reduction and predicted thermal behaviour based on ambient, load and tap-position forecasts. This supports quicker and safer decisions during peak conditions.

3. Predictive intelligent cooling

The application triggers early cooling intervention, reducing insulation ageing. It supports predictive, automatic and manual control through HMI or SCADA.

4. Installation and validation built for engineers

You initialise static ratings through the WebHMI with a single file load. The system validates load, ambient temperature, tap position, loss ratios, HV currents and top-oil temperature at start-up. Fibre-optic sensors are supported but not required because model accuracy is high.

5. Proven forecasting engine

Our similar-day Machine Learning method forecasts load and tap position. Ambient forecasts derive from recent values. Real-time data then projects changes to the forecast horizon.

6. Optional over-temperature trip

The system monitors winding and top-oil temperatures against defined limits and can execute a controlled trip when required

7. Economics that expand the number of assets monitored

The high cost of monitoring meant that typically only the largest assets were protected. CGI Power Transformer Manager makes it possible to monitor more of your assets.
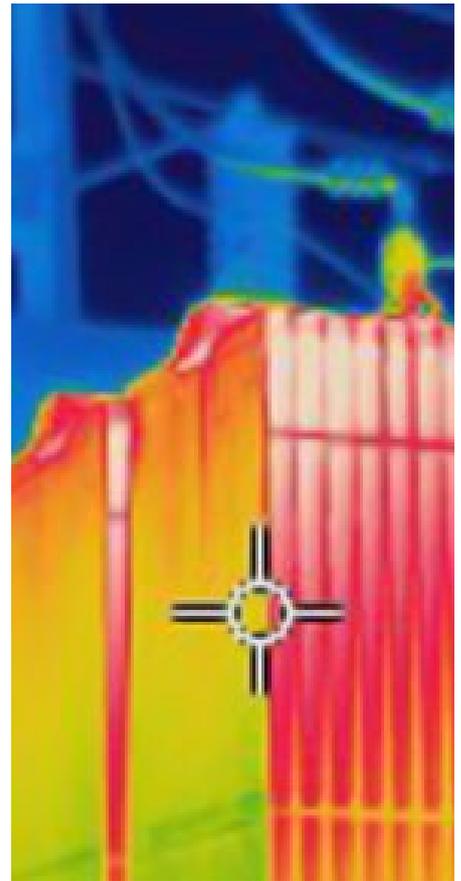
About CGI

Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-focused to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

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