

Transformer On-line Monitoring

Monitoring for increasing the economy of transformers.

Increasing operating safety and lifespan while simultaneously reducing costs – these are the advantages of the transformer monitoring system TOM.

This flyer describes in overview how the transformer monitoring system TOM can assist the user during operating the transformer.

TOM helps the user to understand the condition of his transformer during operating as well as providing a record of the transformers condition. If irregularities occur, the monitoring system assists and provides necessary information for the operator and the management. This will help to secure the reliability of generating power and can simultaneously reduce maintenance costs by offering the necessary information for tailoring a maintenance plan to the condition of the transformer.

The modular design of the system makes it possible to tailor each system to the wishes and requirements of each customer. An inventory of the buyer's wishes and demands is the starting point for each system design.

The advantages at one glance.

- integration of the system into the existing control technology
- condition monitoring
- precise fault analysis
- trend recognition
- saving the relevant data
- possibility to estimate subsequent costs
- condition-oriented maintenance



The Features – 100 % Adaptability.

Through its modular design, the transformer monitoring system TOM can be adapted to customer requirements as well as for any future needs.



Basic functionality of the monitoring system.

- monitoring historical and on-line data
- report-writer
- issuing data in lists and diagrams
- trend-analysis based on all input signals
- alarms on set limits
- user-set actions on occurred alarms, like control of cooling-system
- data-output as files, usable with MS Excel

Optional functionality of the monitoring system.

Control of the cooling-system.

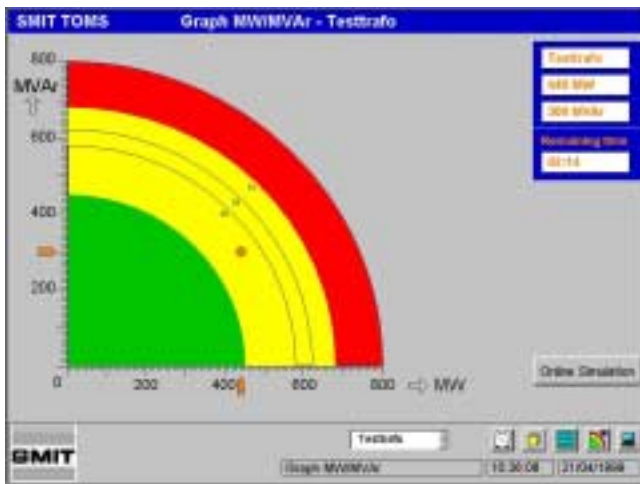
Dependent on the status of the pumps and the fans and the measured temperatures (inlet and outlet piping) the system can control the cooling equipment automatically.

Loss of life.

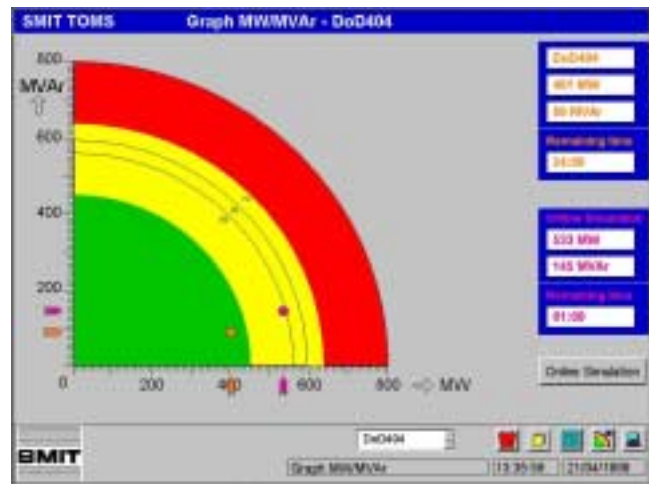
Based on the measured and calculated (in conformance with IEC 354) actual hot spot temperature the loss of life is calculated and accumulated for the total loss of life. Review of loss of life over a selected period is also possible.

Predictions on the thermal behaviour of the transformer in an on-line situation.

Based on the IEC 354, the expert knowledge of Smit Transformers, and actual loading and temperature information the system can predict how long the transformer can remain in operation until critical temperatures are reached. In addition an on-line overload simulation function is available, which tells the operator the actual possibilities for overloading. This provides the necessary insight to assess the possibilities and alternatives for directing and managing energy flow across the network.



Overload



Simulated Overload

Predictions on the thermal behaviour of the transformer off-line.

The expert knowledge of Smit Transformers has been combined with the IEC 354 to predict how long the transformer can remain in operation at below-critical temperatures from a given, user-definable, load curve. This gives the operator an overview of the thermal behaviour and the loss of life during the given scenario.

Maintenance support with regard to the OLTC.

With the transformer monitoring system TOM it is possible to communicate with the tap-changer monitoring system[®] TM100. This integrates the most important information from the OLTC and can advise on maintenance or warn of possible critical OLTC situations.

The tap-changer monitoring system[®] TM100 is based on the expert knowledge of Maschinenfabrik Reinhausen.

Monitoring other signals.

Any standardised digital or analogue signal can be connected to an input channel on the system. Software scaling is subsequently used to process the input signal for on-line monitoring, historical trending and alarm triggering on user-definable limits for the monitored signal.

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