



e-on Bayern

FLIR thermal imaging cameras help prevent power failures at utilities

'Detecting maintenance issues before failures occur is crucial to E.ON Bayern'

In Western Europe electricity is usually taken for granted. Due to thorough maintenance programs power failures are a thing of the past in most European countries. To ensure continuous power supply regular inspections of the network's components are really a must. FLIR thermal imaging cameras can play an important role in determining the state of operation of these components, so utility companies can more accurately maintain and repair their network.

One of the first European utility companies that realized the potential of thermal imaging technology for the maintenance of their electricity network was E.ON Bayern. "In our maintenance program thermal imaging plays a pivotal role in ensuring that components are replaced in time, before any failures occur", explains Ronald Hintzsche, head of the measurement department of E.ON Bayern.

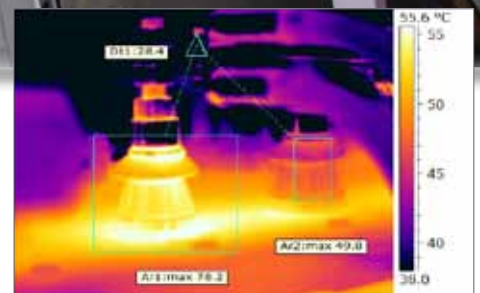
E.ON is a power and gas utility company of German origin. It is the main power supplier in central Europe and combined with its subsidiaries it is also one of the world's largest investor-owned power suppliers. One of E.ON's subsidiaries is E.ON Bayern, headquartered near Regensburg, Bavaria. With a network area stretching over 41,000 km²

E.ON Bayern is one of the largest regional energy service providers in Germany.

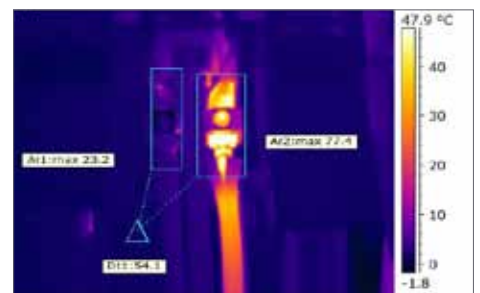
Most electronic components heat up before they break down. "Detecting this rise in temperature in an early stage allows us to plan our maintenance accordingly and to prevent costly failures", continues Hintzsche. "The thermal imaging cameras from FLIR Systems play a crucial part in our preventive maintenance program."

All components are checked periodically

The predictive maintenance program contains an exact planning of when each part of the systems needs to be inspected, depending on the importance of that part for the operation of the entire system and on how prone its components



With temperatures approaching 80° C this transformer requires further inspection.



This connector has become resistive due to loosening and corrosion. This can be easily remedied by opening, cleaning and reassembling the connector.





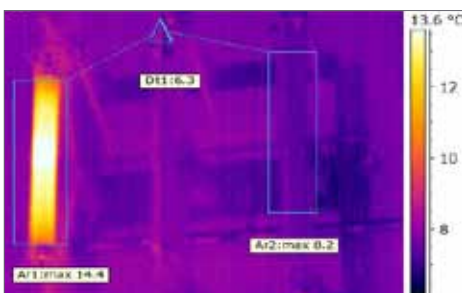
Otto Heigl, thermographic inspector at E.ON Bayern, demonstrates the use of the FLIR thermal imaging camera.

are to failure. "Each component of the existing network is checked at least once in every 12 years", explains Hintzsche. "Due to our long-standing experience we define a separate maintenance cycle for particular network components. But crucial parts will be inspected in cycles of 4 to 5 years and some installations near busy traffic intersections or in difficult industrial environments where the components can be affected by pollution, such as salt, dust, smoke or soot, are inspected once a year."

The thermography team reacts immediately to the slightest deviations within the network processes. "An inspector or technician might hear a strange sound in the transformer of a substation, for instance", explains Otto Heigl, one of the thermographic inspectors that use the thermal imaging cameras. "In such a case we have to find out whether there is a problem and if there is a problem we have to find out very quickly what is causing it. Our FLIR thermal imaging cameras help us to do that."

Excellent thermal image quality

The cameras used by E.ON Bayern's inspectors are one FLIR P65 thermal imaging camera and three FLIR P60 thermal imaging cameras. Both of these models incorporate an uncooled microbolometer detector that produces thermal images at a resolution of 320 x 240 pixels and a thermal sensitivity of below 80 mK. "One of the reasons why we chose these models, apart from the



The overheating high voltage fuse should be replaced and the contacts should be cleaned.

excellent image quality and accurate temperature readings, was the visual imaging camera", Heigl explains. "It helps us to exactly locate which component is showing up as being hot on the thermal image."

Interchangeable lenses

Another advantage is the fact that these thermal imaging cameras from FLIR have interchangeable optics. "We use a 45° wide angle lens for close up inspections of transformer stations or substations and for long distance observations of power lines or high voltage transformation substations we enhance the lens by a 7° telephoto lens. This flexibility is very important for us."

Word compatible software speeds up reporting

To enable better maintenance predictions the thermal data gathered in the field is combined into a report, using FLIR Reporter software. "Because the software is fully compatible with Microsoft Office we can easily and swiftly compile reports with the most commonly used text editor: Microsoft Word", Heigl explains. "Everybody can immediately start using the software, since most people know Word already."

The models currently being used at E.ON Bayern – the FLIR P60 and P65 – that were bought in 2004 and 2005 are not currently marketed by FLIR Systems. In the current product range these models have been replaced with the FLIR P660 thermal imaging camera. It mostly has the same important features, such as a visual imaging camera and interchangeable lenses, but its uncooled microbolometer detector produces better thermal images with a resolution of 640 x 480 pixels and a thermal sensitivity of below 30 mK.

The older FLIR models used by E.ON Bayern still function perfectly, however. "And if there is a problem with one of our cameras the service we get from FLIR is very good", adds Hintzsche. "The camera is repaired and sent back very swiftly."

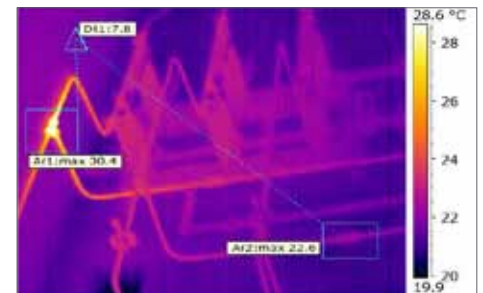
Good training is crucial

The operation of thermal imaging cameras from FLIR Systems is relatively easy, but that doesn't mean that it's just a matter of pointing the camera at a network component and pressing a button, explains the head of the measurement department Hintzsche. "It's very important that the operator knows at least the basics of thermographic theory. Without that knowledge it is very easy to draw the wrong conclusions.

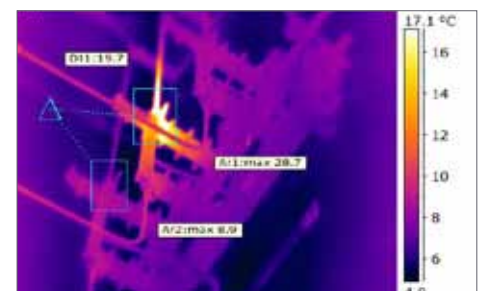
Luckily, FLIR offers thermography courses in co-operation with the Infrared Training Center (ITC). We therefore make sure that all of the inspectors at E.ON Bayern have at least followed a three-day thermography training course at the ITC."

FLIR: a reliable long term partner

As the old FLIR P60 and P65 models are still functioning properly, the purchase of a new thermal imaging camera is not yet an issue at E-ON Bayern, according to Hintzsche. "But when the time comes to look for new thermal imaging cameras, FLIR will be our first choice. FLIR simply delivers the best combination of thermal imaging camera quality, very good repair service, excellent customer support and top of the line training options. And as the global market leader FLIR has also proven to be a reliable long term partner, so why change our thermal imaging camera supplier? When buying a new thermal imaging camera becomes an option again our choice is clear: it will be a FLIR."



The T-connector that shows up as a hot spot is overheating due to increased resistance. This can probably be solved by cleaning the connector.



This wait switch requires further inspection and might have to be replaced.

For more information about thermal imaging cameras or about this application, please contact:

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