

FLIR

APPLICATION STORY



The city center of Szeged during the 2006 floods

FLIR systems ThermaCAM P-series infrared camera used to maintain pumping stations for flood prevention

An extended system of hydraulic structures prevents one of the major rivers of Central Europe from flooding. A FLIR Systems ThermaCAM P-series camera is used to inspect the numerous pumping stations in an affected district and played a key role in keeping the pumping stations up and running during the hazardous spring 2006 floods in southwest Hungary.

The 1,360 km-long Tisza is one of the major rivers of Central Europe. It originates in Ukraine, flows partially along the Romanian border, passes through Hungary touching the border with Slovakia, and falls into the Danube in Serbia. The Tisza drains an area of about 157,000 km².

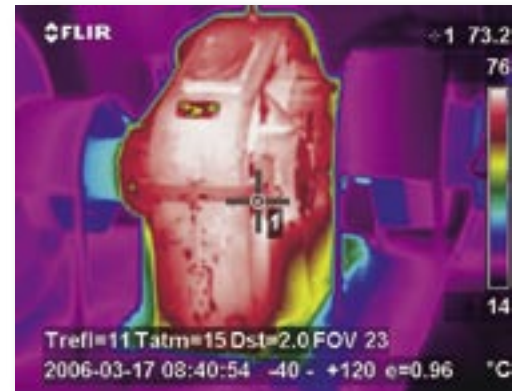
Flooding has been and still remains a permanent danger; the Tisza has many curves and turns as it flows through one of the largest flat areas in Europe. And over the past years, its water levels have become more often critical, a development which could be attributed to the climate change. In Hungary, local authorities started as early as 1846 to build what has now become the largest flood protection system in Europe. The river is sided by an extensive network of pumping stations, which are used to divert the surplus water from the river into canals and water reservoirs or artificial lakes.

These pumping stations play a vital role in flood protection and they require appropriate inspection and maintenance.

The Directorate for Environmental Protection and Water Management of the Lower Tisza District, which oversees the river basin in that southern Hungarian area, saw the need for a monitoring of its pumping infrastructure and decided to invest in a professional infrared camera, the only reliable non-contact instrument which is able to scan and visualize entire surfaces of machinery and electrical equipment quickly and accurately. They purchased a ThermaCAM P65 at Grimas Kft., the distributor of FLIR Systems in Hungary who also took care of the technical aspects and customer training.



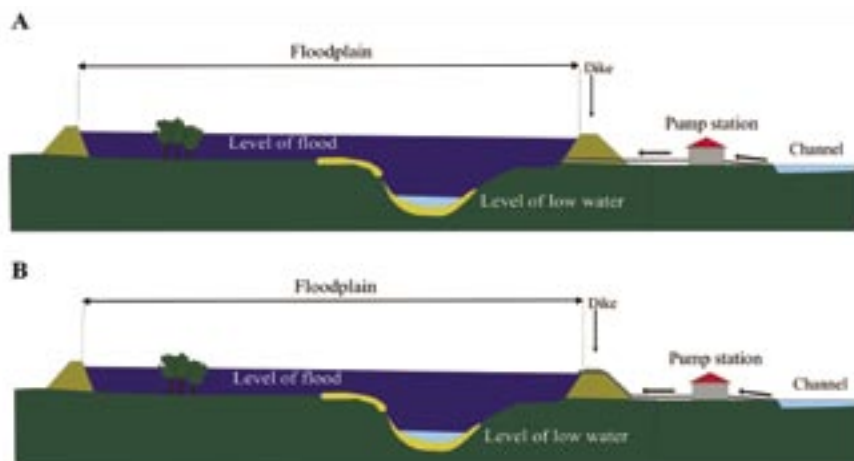
◆ Machinery inside pump house



Pumping plant below the water level and behind sandbags

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The infrared camera played an important role during the severe floods in spring 2006, which broke previous Tisza water level records. "Thanks to a continuous monitoring with the infrared camera, the more than one hundred pump stations in our district did not fail during that critical period", says Peter Kozak, Manager at the Lower Tisza Water Management Directorate. A sudden breakdown of a pumping station would not only enlarge the flooded area; hydraulic pressure, caused by the high water level, would badly damage the infrastructure on the dykes as well.

Luckily, Kozak's colleague, Karoly Fiala, started to systematically inspect all mechanical and electrical installations of the area before the severe flooding.

„Before using the thermal camera, we used to check every single item by „hand“. This was time-consuming and quite risky. And we were not able to examine the stations during operation.”

“The ThermaCAM P65 is a truly professional camera which allows to work easily and quickly”, says Fiala. “We made hundreds of images. And the faults we found were repaired according to their priority.” Problems spotted were :

- Overheated connections, fuse problems
- Overloaded electronic cables
- Operation problems in the condenser, contact problems.

- Overheating of pumping station machinery due to insufficient cooling in continuous operation etc.

Moreover, the thermal camera, combined with the expertise of the inspector, allowed to precisely indicate which of the parts had to be replaced. A substantial asset, at prices of more than EUR 400 for a specific fuse and some thousand of these fuses in operation.

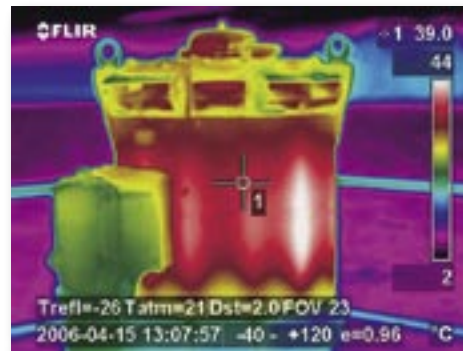
“Without thermography, the inspection and maintenance of the pumping stations and other infrastructure during operation would be complicated, risky and difficult” concludes Grimás manager Csaba Wesser, who provided training and support and guided the two engineers through their first inspection rounds.

Meanwhile, the Lower Tisza Directorate has set up a continuous monitoring scheme of the pumping stations: Tisza floods endanger up to a quarter of the surface of Hungary, an area of approx. 23,500 sq km, where 20% of the population live and work.

And the ongoing climate change will make a consistent maintenance of the flood prevention infrastructure even more vital.

Thanks to Kornélia Nagy of FLIR Systems distributor Grimás, Budapest, Hungary, Cecilia Trojmar and Henrik Akerblom of FLIR Systems Sweden for providing contacts and support

Temporary pump installation at place where flood water meets inland water



◆ Pump installation working outside



Pump station behind dyke

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