



## APPLICATION STORY

### FLIR cameras help protect biofuel supply for Stockholm area

**FLIR A615 thermal imaging cameras monitor large wood piles for spontaneous combustion.**

Just like with many other organic materials, storing wood materials in large quantities and for a long duration always carries the risk of spontaneous combustion and fires.

Söderenergi is the Swedish energy provider for Southern Greater Stockholm and makes use of Sweden's largest biofuel co-generation plant for the generation of electric power and heat. A constant supply of biofuels, such as forestry waste and wood chips, makes sure that this power plant runs smoothly. In a dedicated fuel terminal in the city of Nykvarn, near Stockholm, these biofuels are stored and piled in massive heaps. Typical of storage of such organic materials, is the danger of self-combustion. In order to keep that risk under control, Swedish thermal imaging specialist Termisk Systemteknik provided an innovative fire prevention system, based on thermal cameras from FLIR.

Söderenergi's Igelsta plant, based in Södertälje, operates on the concept of CHP, Combined Heat and Power, and produces both heat and electrical power by burning biofuels and recovered fuels. The principal input is forestry waste, mainly tree branches and tree tops, but also wood chips, bark and shavings etc.

From a dedicated fuel terminal in Nykvarn, near Stockholm, the biofuels are supplied to the CHP plant via road and rail transport. The fuel terminal extends across eight hectares and has space to store a variety of materials.

#### RISK OF SELF-COMBUSTION

Just like with many other organic materials, storing wood materials in large quantities and for a long duration always carries the risk of spontaneous combustion and fires. For a company like Söderenergi, fires not only lead

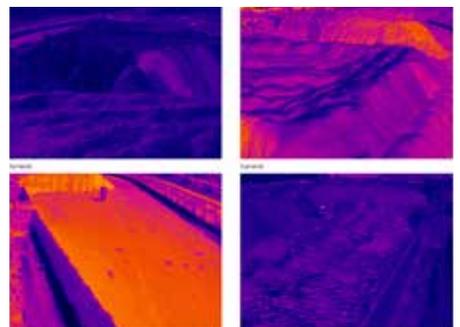
to huge production losses; fighting a fire and cleaning up afterwards is a costly affair as well, possibly amounting up to as much as 80,000 Euros.

Olle Ankarling, plant manager at Söderenergi Nykvarn, points at another pressing issue: "If we cannot control fires or prevent them from breaking out, then in the end we will lose the permit for having our operations here, and we will need to close down the terminal. Unfortunately, with biofuels, you cannot exclude risk entirely, even if all operations are performed by the book. That's why we need to have a monitoring system to give us an early alarm."

Regular inspections by means of visual monitoring and by temperature probes have been a way for the company to spot upcoming heat development and prevent fires. However,



The FLIR A615 is a compact and affordable thermal imaging camera producing crisp thermal images of 640 x 480 pixels.

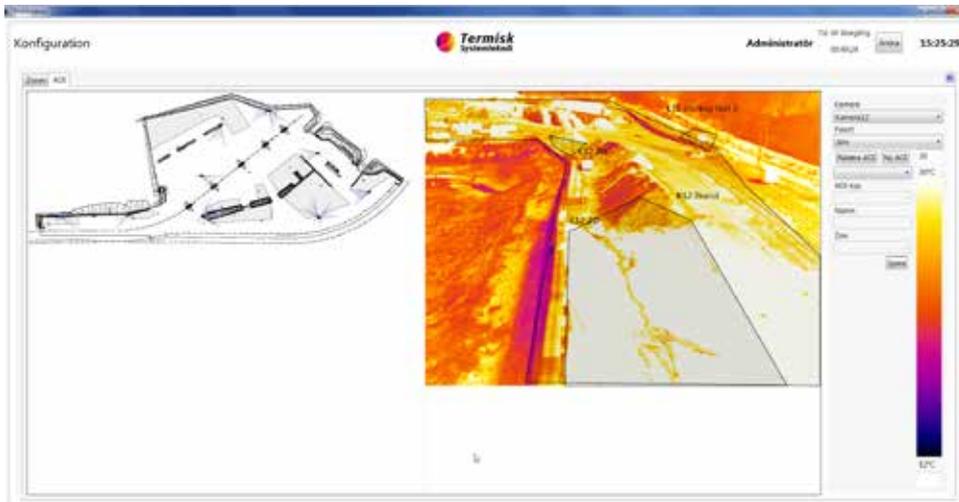


The FLIR thermal imaging cameras can monitor the whole storage area, all piles at the same time, from top to bottom.

this approach takes many man hours, if done thoroughly and reliably. Also, a temperature probe will measure the temperature inside a wood pile at one point; it does not really see how temperature is developing in a larger area of the pile.

#### PREVENTING FIRES, UNDERSTANDING HEAT

In 2015, Söderenergi issued a tender for a reliable fire prevention and monitoring system. The company not only wanted to



By continuously scanning an area, the TST Fire System will find elevated temperatures and identify the fire risk at an early stage, before it has a chance to develop.

generate alarms at the early development of a fire in the different areas of the fuel terminal; the goal was also to develop an understanding of how these fires develop, in order to be better prepared and be able to anticipate.

The tender was won by Termisk Systemteknik, a distributor of FLIR cameras, and an integrator of fire prevention and detection systems for indoor and outdoor use. The company's flagship product is the 'TST Fire' Early Fire Detection System. This system continuously analyzes the thermal camera stream in real time and automatically generates an alarm when a predefined temperature threshold has been exceeded.

"By continuously scanning an area, the TST Fire System will find elevated temperatures and identify the fire risk at an early stage, before the fire has a chance to develop," says Claes Nelsson, product manager at Termisk. "Through sophisticated video analytics, TST Fire is also able to suppress unwanted events, for example vehicles moving in the area. This way, the number of false alarms is reduced to a minimum."

Olle Ankarling: "With thermal imaging, we can monitor the whole storage area, all piles at the same time, from top to bottom."

#### RELIABLE THERMAL MONITORING

For the Nykvarn site in Södertälje, Termisk decided to install twelve fixed FLIR A615 automation cameras with an option to add more. Termisk was able to use the existing lighting infrastructure for the installation of the twelve camera units, which together can cover the entire eight-hectare area for hot spots and early fires.

"The FLIR A615 is one of the proven FLIR cameras that we like to use for many of our fire detection projects," says Claes Nelsson. "It is a very reliable camera and its high resolution

enables us to reduce the number of cameras needed to scan the whole area, which makes it very economical."

#### ADDITIONAL FUNCTIONALITY

The TST Fire system with integrated FLIR cameras can also be used to detect unwanted intruders, day and night, and in the harshest weather conditions. "There are many reasons for Söderenergi to detect intruders," says Claes Nelsson. "Possible vandalism or thefts are some of the reasons, but the company is of course also concerned with the safety of people and it wants to prevent any risky behavior of intruders during storage operations in the fuel terminal area."

Thermal cameras can also see through smoke, a feature that is highly appreciated by Olle Ankarling: "Being able to see through smoke, we can monitor our firefighting activities much more efficiently. We had tried this with visual cameras before, but we were completely blinded by the smoke."

#### BETTER FUEL MANAGEMENT

Fuel management for the Söderenergi power plant in Södertälje is not an easy task. Different types of biofuel need to be transported via rail or ship to meet the varying energy demands of the customer. Thermal imaging cameras can help the operators of the fuel terminal in Nykvarn to monitor the temperature of the fuel over time and enable them make intelligent decisions with respect to fuel transportation. Olle Ankarling: "We use the thermal camera system to judge whether a delivery is fit for storage or not. If we have a load coming in that shows an increased heat pattern, we can take it aside and put it on immediate transport to the plant without storing it."

"We can also keep historical data and look how things develop from day to day, from week to week. Because we know it's not the



The FLIR A615's high resolution enables Termisk to reduce the number of cameras needed to scan the whole area, which makes it very economical.



Olle Ankarling, plant manager at Söderenergi Nykvarn: "The thermal imaging cameras have taken away the uncertainty. Today, we are always one step ahead, because we can detect fires and hot spots very quickly, even before a fire breaks out."

actual temperature today that signifies a risk. The heat development over time is much more important."

Claes Nelsson comments: "The information coming from the thermal imaging cameras is continuously combined with wind, temperature and precipitation data from a weather station. This allows the operators of the fuel terminal for example to see how long certain types of fuel can be stored. This is invaluable information for Söderenergi, which allows them to work much more efficiently."

Olle Ankarling: "The thermal imaging cameras have taken away the uncertainty. Before we had them, we never knew when something was going to happen. Today, we are always one step ahead, because we can detect fires and hot spots very quickly, even before a fire breaks out. We know exactly where to look and we know how to handle the risk."

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

[www.flir.com/automation](http://www.flir.com/automation)

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