



FLIR

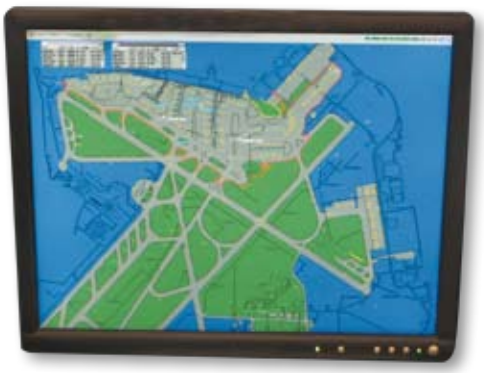
APPLICATION STORY

More than 20 million passengers pass through Copenhagen each year.

Copenhagen Airport installs thermal imaging cameras

FLIR Systems SR-100 cameras make the airport even safer than before.

With the threat of intruders, or even worse, terrorist attacks, making sure that all passengers are safe within an airport is of the utmost importance to commercial airlines and airport authorities. But not only passengers, also personnel and valuable equipment need to be protected. FLIR Systems SR-100 thermal imaging cameras help to make Copenhagen Airport an even safer airport than before.



Ground radar follows everything leaving or entering the Critical part of the Security Restricted Area (CSRA). The borders of the CSRA are marked with a red line.

Founded in 1925, Copenhagen Airport was one of the first civil airports in the world. Today, Copenhagen Airport is the biggest airport in Scandinavia measured not only in total number of passengers, but also in international traffic, direct long haul routes and total number of destinations. More than 20.9 million passengers passed through the airport in 2006. Centrally located in Scandinavia, with the most extensive route network and the highest population density in the region, Copenhagen Airport is the logical choice for all passengers traveling to/from Scandinavia.

Copenhagen Airport covers an area of 12.4 square kilometers and has a 30-kilometre-long perimeter fence. Organizing appropriate surveillance for such a large area is an enormous task. In addition to camera surveillance, the airport is also monitored by driving and walking patrols, both indoors and outdoors, around the clock.

More than 700 specially trained security staff members, police officers and others, play an active role in the security set-up so that passengers can feel safe and secure during their trip.

Monitoring the Critical part of the Security Restricted Area (CRSA)

"Although we are meticulously monitoring the entire airport, we are especially concentrating on the Critical part of the Security Restricted Area (CSRA)", explains Mr. Frank Christensen, Dept. Head of Department of the Copenhagen Airport Security Operations Center. "This area comprises all buildings accessible to passengers, the piers used for boarding and un-boarding the passengers, the parking area for the airplanes, ... We have 108 airplane stands so it is a huge area to monitor. Everyone going into the CSRA, needs to be thoroughly security checked before they can enter. Nothing can enter or leave the area without the Security Operations Center knowing about it."

"One of the problems we are facing is that the CSRA borders the runways. Airplane going from the piers to the take-off area, or airplane that have just landed and are taking their passengers to one of the piers, are coming from an "unsecure" area into the CSRA. Also cars and people from other areas within the airport, but outside the CSRA, could enter the area. Therefore we thoroughly monitor all the entrances





A part of the control room of the Security Operations Center at Copenhagen Airport.

and exits of the CSRA with different types of sensors and with ground radar. Furthermore, all planes and airport personnel going into the area or leaving it have to notify us. Although ground radar and sensors warn us when something is happening, we can not see what it is. Therefore, everyone and everything entering or leaving the CSRA is also followed with cameras so that we know what is happening."

"Monitoring and following objects with a camera is easy during daytime. But during night time we could not see anything with our daylight cameras. It is impossible to light up the entire CSRA, since we can not put lighting poles everywhere. This would obstruct the airplane traffic from and to the runways. However, if an alarm is triggered, we want to be able to see what has caused the alarm before we send out security guards to check the situation. In order to solve the problem we thought of thermal imaging.", explains Mr. Christensen.

Left: *Mr. M. Bak of PT Nordic, FLIR Systems distributor in Denmark.*
Right: *Mr. Christensen: Dept. Head of department of the Copenhagen Airport Security Operations Center.*

Thermal imaging:
the solution for seeing at night

"We were extremely enthusiastic during the first demonstrations of the FLIR Systems thermal imaging cameras. It became immediately clear that they would be a huge asset to our security infrastructure. We were amazed to see them produce a clear image in the darkest of nights, from unlighted areas, so that we could track and follow objects without effort. Being able to see in total darkness is great for security people. Definitely in Scandinavia where there is not that much daylight in wintertime."

After careful consideration, Copenhagen Airport chose to install FLIR Systems SR-100 thermal imaging cameras. "We chose for the SR-100 because they give us a great range performance. Equipped with a 100 mm lens, they allow us to detect objects from more than 1.5 km away.", Mr. Christensen explains. "Another advantage is that the cameras contain an uncooled infrared detector. This reduces downtime to an absolute minimum. We need to be sure that the cameras are working 24 hours per day, 365 days per year."

The cameras where mounted on a standard Pan/Tilt mechanism by Praecisionsteknik, the FLIR Systems distributor for Security and Surveillance products in Denmark. "We need the cameras on a Pan/Tilt.", Mr. Christensen elaborates. "Once an alarm, generated by the ground radar or other sensors goes off, we immediately need to be able to turn the camera to the right direction. This way we can see what has triggered the alarm and we can follow the object with the thermal imaging camera if necessary."

Easy integration is key

"Although we were very enthusiastic when we saw the first demonstration of the FLIR thermal imaging cameras, one of the key elements in the decision process was the integration of the cameras in our existing security network.", says Mr. Claus Hulstrom, Software Developer at Copenhagen Airport. "We are operating more than 200 CCTV cameras at the airport and the thermal imaging cameras needed to be installed in the same network. Just like all the other cameras we are using, the FLIR Systems thermal imagers can be operated using the PelcoD protocol and could easily be integrated in our existing PelcoD network. In order to install them we just removed some of our normal cameras and installed the thermal imaging cameras. All together this only took us about 2 hours."

Top left and right: Images from the SR-100 thermal imaging cameras displayed on an LCD screen

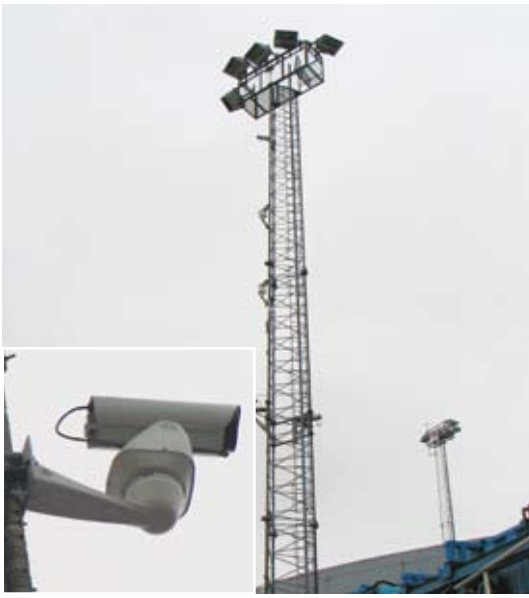
Thermal imaging produces a clear image in the darkest of nights.

Thermal imaging: more than expected

"Now that the SR-100 thermal imaging cameras are installed, they do more than initially planned! We also look at well-lit areas with the cameras. They are not blinded by the lights in any circumstance and deliver a crisp image on which we can see the smallest of details. Furthermore, they are a great help in difficult weather conditions like fog, where normal CCTV cameras can not see anything."

"The cameras sometimes give us even more information. After all, they are infrared cameras that are making temperature differences visible. By e.g. looking at a car with the SR-100 cameras, we can immediately see if it has been there a long time or just arrived. A car with a hot motor generates an entirely different image from a car with a cold motor."

"Thermal imaging has proven its value here at Copenhagen Airport. Thanks to thermal imaging, Copenhagen Airport has become even safer than it was before.", concludes Mr. Christensen.



One of the FLIR Systems SR-100 thermal imaging cameras installed on a Pan/Tilt.

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