MILITARY AIRFIELD CASE STUDY

This military airfield, located in South East Asia, boosts a runway longer than 3,000 m. The airfield houses maritime patrol aircrafts, jet tankers as well as military personnel. Situated in a key area along Asia’s maritime peninsula, the airfield deploys aircrafts to protect the waters under the skies, further strengthening seaward defence and sea lines of communication of the region.

Located in a tropical region where rain is frequent, canals and drainage systems were constructed at the airfield to keep the runway and taxiways free of surface water and prevent flooding. The canals and drainage systems created a point of entry for potential intruders. To secure these points, large drain gratings were installed.

In 2016, the military airfield identified the necessity of a reliable Perimeter Intrusion Detection System (PIDS) as key to upgrade their entire perimeter security system, a solution that could meet critical requirements necessary for a military airfield’s perimeter security.

CLIENT SITE INFORMATION

<table>
<thead>
<tr>
<th>Perimeter Length</th>
<th>16 km</th>
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</thead>
<tbody>
<tr>
<td>Type of Fence</td>
<td>Welded-mesh</td>
</tr>
<tr>
<td>Height of Fence</td>
<td>3 m – 5 m</td>
</tr>
<tr>
<td>Type of Drains</td>
<td>Storm Drains</td>
</tr>
<tr>
<td>Max Length per Drain</td>
<td>40 m</td>
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</table>
**CHALLENGES**

Variety of Perimeter Infrastructures – Typically the PIDS adapts only for a singular type of infrastructure, where one setting fits all. However, there are various types of perimeter infrastructures within a single fence line: walls, various fence types, and drain gratings. The reaction from an intrusion for each structure differs, and the typical PIDS will not be able to adapt appropriately with just one setting.

Maintaining False Alarm Control – To ensure good intrusion detectability, most PIDS would set a high level of sensitivity for their system. This in turn would lead to a high false alarm rate whenever the weather turns. This also impacts the PIDS installed along the drain gratings, increasing false alarm rates whenever water gushes through the canal.

Low Detection Rate – To counter the false alarms along the fence line or at the drain gratings, the PIDS would decrease the sensitivity level. Most of the time, sensitivity levels are decreased to a point where there is a chance of zero detection when an intruder is infiltrating along the fence line or at the drain gratings, especially during bad weather.

Variable Perimeter Length – The airfield has plans in the pipeline to expand the airfield, and as such there will be a mixed of permanent and temporary fences to accommodate the expansion. The PIDS in the field needs to be modular, with sections that are independent of each other as not to affect a huge perimeter length of security during the expansion.

**CLIENT’S REQUIREMENT**

High Probability of Intrusion Detection – To be able to perform with > 90% detection rate of all relevant intrusion / tamper scenarios, even at the drain gratings when above water or submerged.

Very Low False Alarm Rate – To achieve an average of ≤ 3 per km per day in actual environment, even taking into account disturbance from jet blasts and changes in canal’s water flow rate.

Pinpoint Accuracy – To achieve pinpoint accuracy of < 5 m, even at drain gratings.
System Flexibility & Robustness – One PIDS solution to be deployable on a variety of perimeter infrastructures, even when temporary. Ability to minimise system downtime when perimeter line is being expanded or constructed.

Seamless Integration to Existing Systems – Integrate to existing Integrated Security Management System and leverage on existing PTZ cameras.

AgilFence PIDS was deployed on 16 km of the military airfield’s perimeter fences, along with 40 m of continuous storm drains.

AgilFence PIDS uses advanced fibre-based sensors, which are embedded in fibre optics cables, and mounted on existing fences and drain gratings. Intrusions which includes climbing, cutting of fence / drain gratings, tampering of cable, unnatural disturbance on the fence, etc. will be detected by the system and alert security personnel.

Adaptability – AgilFence PIDS can be implemented on a variety of fence types; chain link, welded mesh, palisade, solid wall and drain gratings.

Easy Deployment – It is a one-step deployment of securing a single pass of AgilFence PIDS sensor cables with high-grade PVC cable ties onto perimeter fencing. For drain gratings deployment, the sensor cables can be routed down from the fence line and through a PVC tube secured to the drain gratings. There are no electronics and power in the field, so there is no fear for any sort for electrical and radio interference.

Secure Architecture – An open-loop system coupled with the flexibility of the sensor cables deployment, segregates the sensor cables into 180 m channels. Each channel acts independently without affecting others. This addressed perimeter expansion, where the user may remove or disarm a singular channel for fence construction or removal without fully compromising on the airfield’s entire perimeter security.

Low False Alarm rate – The proprietary signal processing software has the ability to adapt and adjust automatically to different environmental factors and weather elements along the fence line and canals, reducing false alarm rates without compromising the integrity of the system’s intrusion sensitivity.

Accurate Pinpointing – Fibre sensors spacing customised to the perimeter length and type of perimeter infrastructure, the sensor accuracy for pinpointing an intrusion location range is typically ± 3.6 m. This in turn leverage on the features of Pan-Tilt Zoom (PTZ) cameras, where the PTZs can be preset and auto-triggered to slew to the point of intrusion. Thus providing the user the ability to visually verify the alarm and track the intruder.

Paired with the PIDS solution was AgilFence Integrated Alarm Management System (iPAMS), capable of interacting with the military’s airfield existing CCTV and Integrated Security Management Systems.