

PERIMETER PROTECTION IN A MILITARY ENVIRONMENT

Case study: Military Airfield



INTRODUCTION

This military airfield located in South East Asia boasts 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.

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

In 2016, the military airfield started sourcing for an innovative and reliable Perimeter Intrusion Detection System (PIDS). They sought for a solution that could meet critical requirements of a military airfield’s security standards.

CLIENT SITE INFORMATION

Perimeter length: 16 km

Type of fence: Welded-mesh

Height of fence: 3 m – 5 m

Type of drains: Storm drains

Max length per drain: 40 m

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, different 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 Low False Alarm**

To ensure good intrusion detectability, most PIDS would set a high level of sensitivity for their system. This in turn would lead to high false alarm rates when 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 no detection during a real intrusion, especially during bad weather.

■ **Variable Perimeter Length**

The airfield has plans 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 REQUIREMENTS

■ **High Probability of Intrusion Detection**

To be able to perform with > 95% detection rate for 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 after taking into account the 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, including temporary ones. 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'S SOLUTION

AgilFence PIDS was deployed along 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 include climbing, cutting of fence / drain gratings, tampering of cable, unnatural disturbance on the fence, etc. will be detected by the system and immediately conveyed to the security personnel.

■ **Adaptability**

AgilFence PIDS can be implemented on a variety of fence types; chain-linked, 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 is no electronics and power supply in the field, so there is no fear for any sort for electro-magnetic and radio frequency interference.

■ **Secure Architecture**

An open-loop system coupled with the flexibility of the sensor cables deployment, segregates the sensor cables into 240 m channels. Each channel acts independently without affecting others. This addressed the scenario of 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 comprising the integrity of the system's intrusion sensitivity.

■ **Accurate Pinpointing**

Fibre sensor spacing is customised to the perimeter length and type of perimeter infrastructure, and the sensor accuracy for pinpointing an intrusion location range is typically ± 2.4 m. This in turn leverages on the features of Pan-Tilt Zoom (PTZ) cameras, where the PTZ cameras can be preset and auto-triggered to slew to the point of intrusion. This provides users 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.



SUMMARY

The implementation of AgilFence PIDS was crucial to a critical facility like the military airfield. It can potentially reduce reaction time by the security teams in times of threat and provide a peace of mind for militants on site. Confidential assets are also protected more securely.

Validated by various institutes such as the UK Centre for the Protection of National Infrastructure and Safe Skies, AgilFence has proven time again its effectiveness when deployed in different scenarios ranging from substations to airfields, and the capability to cater world-class perimeter security to any facility.

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