

# PERIMETER PROTECTION IN A POWER DISTRIBUTION GRID ENVIRONMENT

Case study: Power Substation



## INTRODUCTION

Power substation is one of the important elements in any electrical generation, transmission and distribution ecosystem. This element plays a key role in ensuring effective distribution of electricity to cities and homes, and it is critical to have a world class perimeter intrusion detection system.

Innovation-driven and objective-led, AgilFence specialises in the security of critical infrastructures. Our suite of state-of-the-art perimeter protection systems provide a gamut of intelligent protection and surveillance solutions that will help safeguard key installations and assets, and protect human lives.

These highly-advanced, reliable and effective solutions are designed to address your specific security concerns no matter how extensive and complex; delivering optimum protection that's customised to address potential threats effectively, but also your peace of mind.

### CLIENT SITE INFORMATION

No. of Sites: > 30

Site Perimeter Length: 150 m – 2,600 m

Type of Fence: Chain-Linked

Height of Fence: 2.2 m – 2.5 m

Width of Fence: 2.5 m

## CHALLENGES

### ■ Remote & Isolated

Substations are located either in wide open fields, far away from population or in suburban zones in highly populated areas. Due to the wide spread of these substations in a city or country, infrequent security visits to the sites were common and only when problems emerge will security take action.

### ■ Scavenging Wildlife

Cases of wildlife trespassing substations have been rising. In the process of rampaging the substation, these animals may end up harming themselves and damaging high-value equipment within the compound.

### ■ Copper Theft

Copper, an efficient conductor of electricity, runs within the substations cables. Thieves have and will continue to trespass into substations and remove those valuable cables, resulting in a loss of power. Constant replacement of copper cables is uneconomical and every second in a power loss situation means that the utility company generates less income. **There is an estimated loss due to damages and thieves amounting to at least US\$ 1 Billion a year.**

### ■ Lack of Early Detection

Substations need to minimise their losses, and prevent such incidents from taking place. Having a fence surrounding their perimeter was insufficient; thieves could climb over and wildlife ramps through it.

### ■ Challenges of Inclement Environment

Wind, rain, snow, storms affect the false alarm rates in a PIDS. A trade-off is usually made by decreasing the sensitivity of the PIDS. However, this meant that when an intruder climbs the fence, be it free-hand or using a leaning ladder, the real-life intrusion will not be detected.

## CLIENT'S REQUIREMENTS

### ■ High Probability of Intrusion Detection

To be able to perform with > 95% detection rate for all relevant intrusion/tamper scenarios.

### ■ Low False/Nuisance Alarm without Trade-off to Security

Maintain low false and nuisance alarm rates at all areas while preserving high probability of detection.

### ■ Pinpoint Accuracy

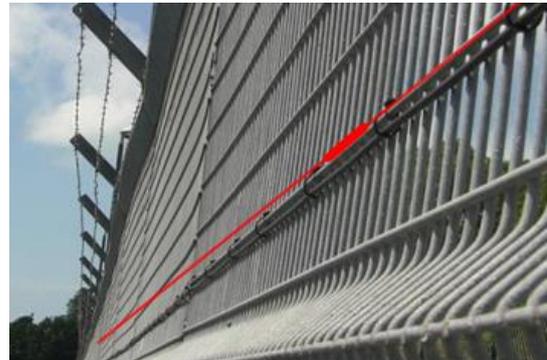
To achieve pinpoint accuracy of < 5 m.

### ■ 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.



## AGILFENCE'S SOLUTION

AgilFence PIDS uses advanced fibre-based sensors, which are embedded in fibre optics cables, and mounted on existing fences. Intrusions which include climbing, cutting of fence, 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 and solid wall.

### ■ **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. 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 the power substation'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, 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 < 5 m.

Paired with the PIDS solution was **AgilFence Integrated Alarm Management System (iPAMS)**, capable of interacting with the power substation's existing CCTV and Integrated Security Management Systems.

Based on our track records and many completed trials, AgilFence has constantly emerged to be a truly performing and effective solution capable of securing substations at isolated areas and turning losses into benefits.



## SUMMARY

The implementation of AgilFence PIDS was crucial to a critical facility like the power substation. It can potentially reduce reaction time by the security teams in times of threat and provide a peace of mind for the security personnel 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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