Use Case
TIR-ID26.75

“Equipment Storage and Laydown Yard Security”

An Intrusion Detection and Targeted Surveillance Use Case Paper

1450 West 105 North – Orem, Utah
www.thermalradar.com

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EXECUTIVE SUMMARY

Equipment storage and laydown yards have fallen victim to vandalism and theft in recent years. Specifically, criminals are looking for copper or other valuable components which can easily be traded, sold or melted down for immediate income to the thieves. The challenge for companies that face these crimes is not only the cost of the equipment being stolen but the lag time that might occur with having to reorder equipment as well as the lost man hours and operational time lost when work crews are waiting for missing equipment. Equipment storage yards face a variety of challenges with securing facilities against intrusion, vandalism and theft. Many times, these equipment yards and storage areas are in remote locations and some are in temporary storage facilities. Standard IP cameras are often utilized but do not provide accurate intrusion detection and must be monitored by a person if real time intrusions are going to be detected.

SCENERIO

Thermal Imaging Radar, LLC (TIR) was asked by an Electrical Utility to provide a demonstration of its Thermal Radar product at a service center in Hurricane, Utah. TIR utilized a point to point Wi-Fi connection from the Thermal Radar unit to the computer hosting the viewing software. The Electrical Utility’s service technicians and management were required to enter the service center and it was not uncommon for them to enter the property during off hours and weekends. The Electrical Utility was looking for an intrusion alert solution to detect any non-employee or unauthorized employee who might be trying to gain access to the property during off hours. The demonstration was set as a 120-day demonstration.

REQUIREMENTS FOR INTRUSION DETECTION

- Detection Solution must:
  - Be a cost effective solution.
  - Be able to detect an intrusion during the day and night.
  - Provide specific geo-location of the intrusion so that axillary security measures can be deployed.
  - Alert multiple parties in real time in control center and via email and text.
  - Provide persistent surveillance and situational awareness.
  - Have analytics so as to ascertain the nature of the intrusion whether man or vehicle.
  - Must interface with existing camera systems and VMS platforms for a slew to cue operation.
  - Must have recording capability to review history.

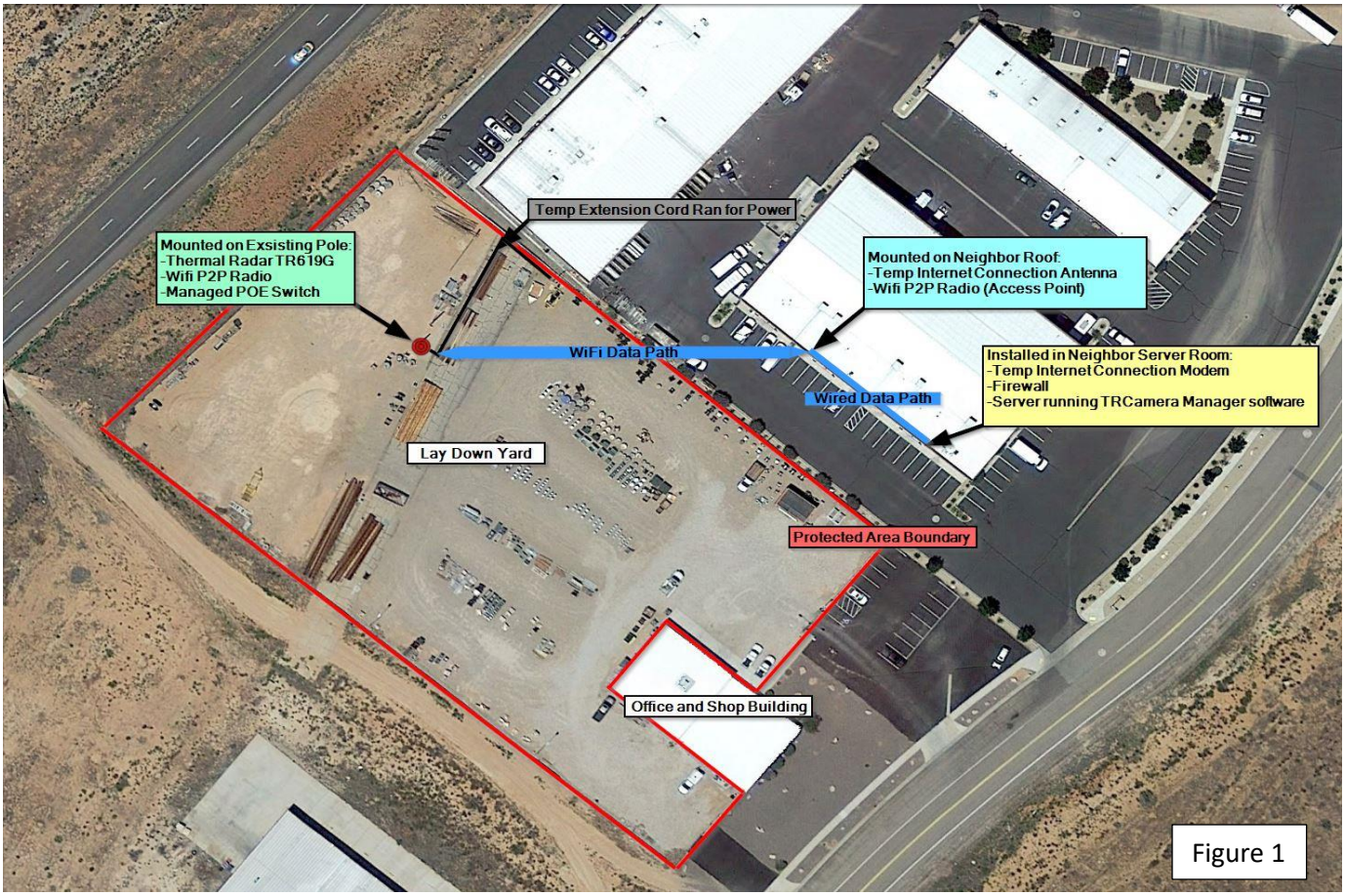

Figure 1

EXISITING ON-SITE SECURITY SYSTEMS

The Electrical Utility had previously installed several day/night cameras at a central location to monitor the facility. Lack of available bandwidth and poor site lighting were two of the most limiting issues for the service center. Thermal Radar offered to provide a 360° situational awareness solution for the entire facility with a single camera with the added benefit of adding pre-incursion detection as well as post-incursion monitoring. A single camera could ease the low bandwidth issue and the thermal nature of this product made the poor lighting conditions a non-issue.

THERMAL RADAR'S "INSIDE-OUT" SECURITY APPROACH

Thermal Radar addresses the problems associated with both day and night detection of intruders by combining a FLIR Tau2 thermal imaging sensor with a rotating assembly and an edge-based video analytic package. Thermal Radar has patented single frame analytics that are specifically geared towards a low frame rate 360° thermal camera system. With Thermal Radar's analytics, users can create multiple Areas of Interest (AOIs) and be alerted only when an intrusion occurs within the defined area. Once intrusion detection is confirmed, the Thermal Radar unit can push out alert notifications through WI-FI, GSM or Satellite communication systems. This alert notification together with the thermal image generated can be sent to multiple users through e-mail, text message, desktop notification or even a Smartphone App and will specify whether the intrusion is a human or a vehicle. Thermal Radar has integrated Geo-spatial software allowing the rotating thermal camera to provide Latitude and Longitude coordinates with each of its alerts.

The diagram below illustrates the inside out approach to Thermal Radar's unique approach compared to traditional fence line detection.

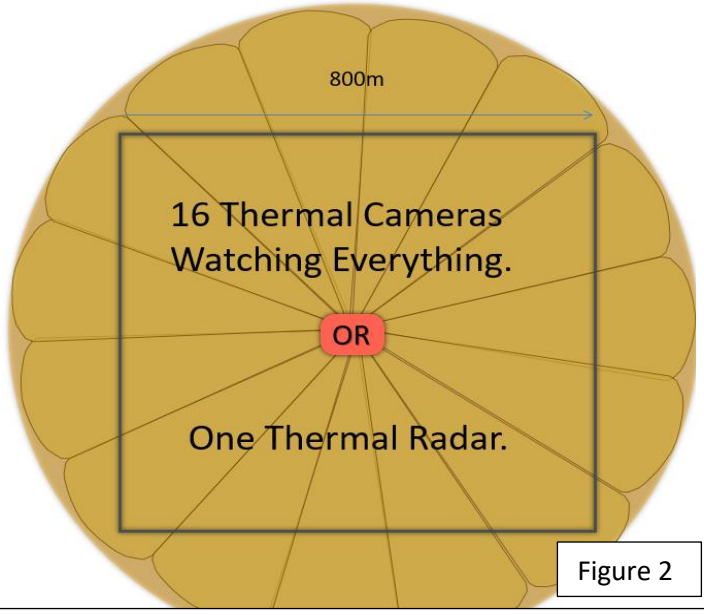

Figure 2

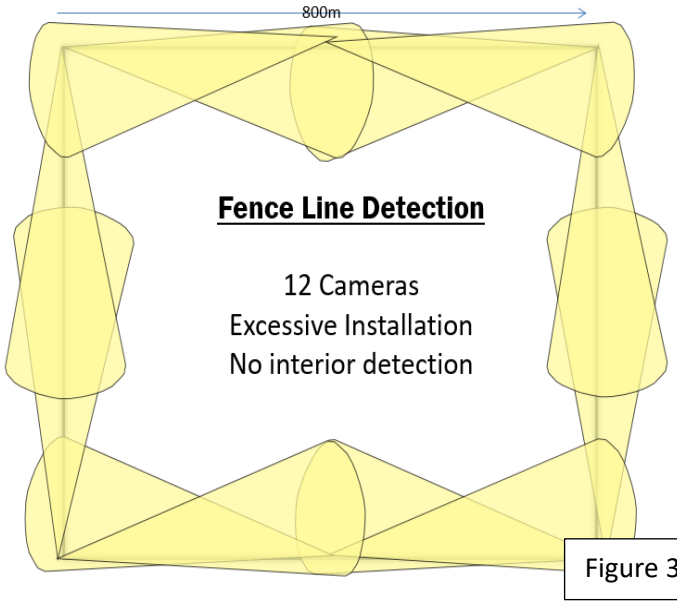

Figure 3

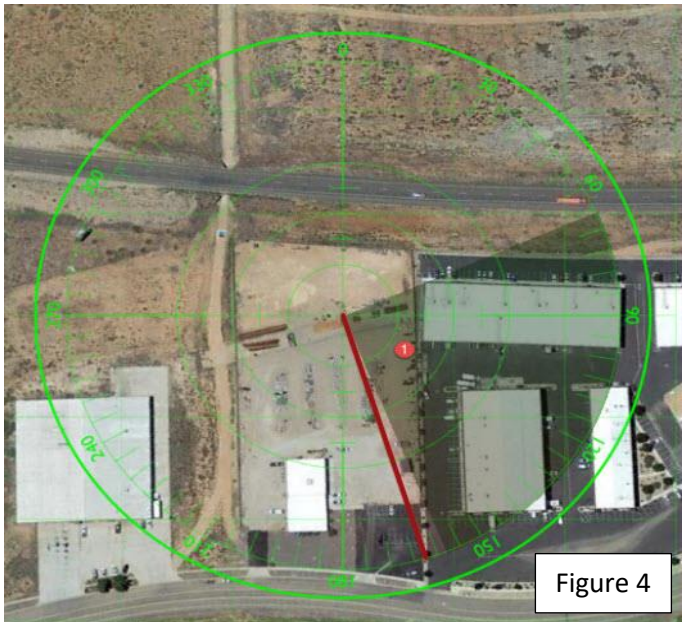
Figure 4

RADAR VIEW

Thermal Radar performs many of the same functions of conventional radar at a fraction of the cost by creatively gleaning depth and location data from its imagery allowing it to pinpoint intruders in a 360° 3D space with an undetectable, passive system. Thermal Radar alerts were generated from the on-board analytics and sent via email and SMS to both Thermal Radar and the Electrical Utility point of contact. These alerts can also be used in a "slew to cue" function with other camera systems.

Figure 4 shows a google earth image of the property where the Thermal Radar unit is being used. This "radar" window provides exact location of the intruder on the property.

RESULTS

Although the demonstration was intended to search for unauthorized intruders, Thermal Radar detected over 100 instances of employees entering the facility during "off hours" over the course of the demonstration. This allowed supervisors to ascertain the legitimacy of the employee visits to the property during off hours and document if employees were driving personal vehicles into denied areas. Thermal Radar provided the real-time intrusion notification alert when they entered to the Service Center Manager via email.

Figure 5

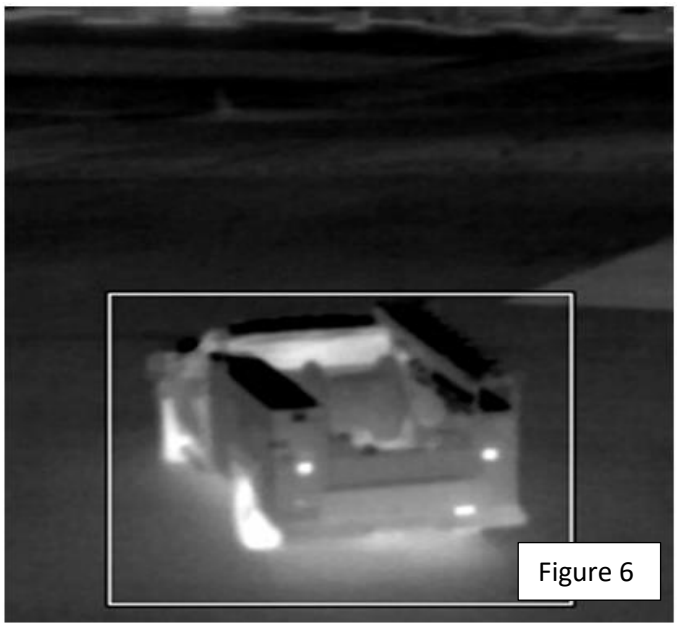

Figure 6

During the four-month demonstration, Thermal Radar detected several instances of people just outside the fence line who appeared to be "casing" or possibly attempting to gain access. Thermal Radar's alert notifications were sent to the Service Center Manager notifying him of the potential threats as well as the authorized entries of the property during "off hours".

During the 4-month demonstration, there was a single occurrence of an unauthorized intrusion where an arrest occurred. The customer incident report narrative stated (see below)

"**At 0154 (25 Feb 17) the Thermal Radar alarm system triggered an intrusion alert in the vehicle lay down yard. Officers saw movement in between two vehicles and sent an officer to investigate. Officer arrived on scene but was unable to see anything on site. As the officer began to leave the area, the Thermal Radar system once again triggered on motion, about 200 meters away from the onsite security officer. At this point, Security notified 911 who dispatched a patrol. The police officer and security officer swept the area but could not find the suspect. Once again, the Thermal Radar triggered on motion and the monitoring security officer saw as the suspect ran to hide in bushes. The police officer was notified where the suspect was hiding, proceeded on foot, and found the suspect. Suspect was arrested on site at 0300."**

TIR learned, during the demonstration, that certain areas of the property where Electrical Utility equipment was stored generated heat based alerts during specific times of the day when the equipment quickly heated up or cooled down due abrupt atmospheric changes during the day. The customer was trained to "fine-tune" the analytics upon setup so that recurring false alarms became a non-issue. Another lesson learned highlighted that detecting people through a chain link fence line required different analytic settings than a person standing 10-20 ft. away from the fence. Quick adjustments were made during the demo and the intrusions were detected.

Thermal Radar Product Summary

Thermal Radar is a mission critical and operationally relevant solution for wide area intrusion detection. Thermal Radar provides real-time 360° situational awareness of any physical incursion that may threaten a perimeter. Thermal Radar provides comprehensive and cost-effective perimeter security using a rotating, FLIR thermal sensor. Thermal Radar software provides a stitched 360° panoramic thermal viewing experience creating unrivaled situational awareness. Thermal Radar's exclusive, edge-based analytic detection capabilities will ensure that your business borders are secure. Thermal Radar can be a low power, standalone detection outpost or the centerpiece of your integrated physical security strategy.

Contact Thermal Imaging Radar, LLC
sales@thermalradar.com
Phone Number: 801.762.6800