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Made by RSI VIDEO TECHNOLOGIES

Cold Weather Rooftop Case Study – January 2009

Test:

Vacant Building and Cold Weather Rooftop System Conducted at Vacant Facility of a Major National Retailer Location: Elk River, MN

Goal:

The goal of the test was to validate operation and performance of the Videofied system in extreme cold weather to protect HVAC units on rooftops and vacant buildings.

Description:

A security integrator with offices in Minneapolis installed a Videofied system to protect the interior and rooftop of a newly vacant property located in Elk River Minnesota. The system consisted of:

- 1 V6000 ET GPRS
  Wireless Extended Temperature VIA-Pro GPRS cell Panel powered by batteries
- 2 DCV 650
  Wireless Outdoor Camera/Sensors powered by batteries.
- 2 DCV 600
  Wireless Interior Camera/Sensors powered by batteries.

The Camera/Sensors are an integrated unit consisting of:

- an advanced Passive Infrared motion detector (PIR)
- a digital video camera
- night vision illuminators
- radio transceiver and batteries

Figure 1: Outdoor Camera Mount

The Panel was mounted inside the building. Two indoor cameras were placed inside the vacant building to secure the interior. The building was heated. Two additional cameras were placed on the rooftop. These were both mounted to a short pole secured in a 5 gallon concrete filled bucket.

For the test, a third-party monitoring service was contracted that alerted Retailer's own command center of all incidents and forwarded all videos received to a notification list for review. It was determined that for the test period, all "detections" by the system would be "dispatched" as alarms by the central station until there was sufficient confidence in system performance.

The construction of this particular building was such that there were no walls at the edge of the rooftop except for the front facade of the store. The roof met the exterior wall at a small curb.

At the initial installation, it was determined that the metal roof deck limited the radio range and camera placement on the roof. The camera/sensors functioned properly as long as they remained close to an opening. As the goal was to ensure that cameras could be placed anywhere on the roof as needed, it was decided to upgrade the standard antenna in the panel to provide adequate radio range for the wireless communications between the panel and the both the cameras above and below the metal rooftop deck. The team returned with an antenna splitter which was installed with an antenna placed both above and below the deck. With this new antenna, cameras above and below the roof deck had radio coverage to the perimeter of the structure.

Figure 2: Rooftop with front wall and side wall

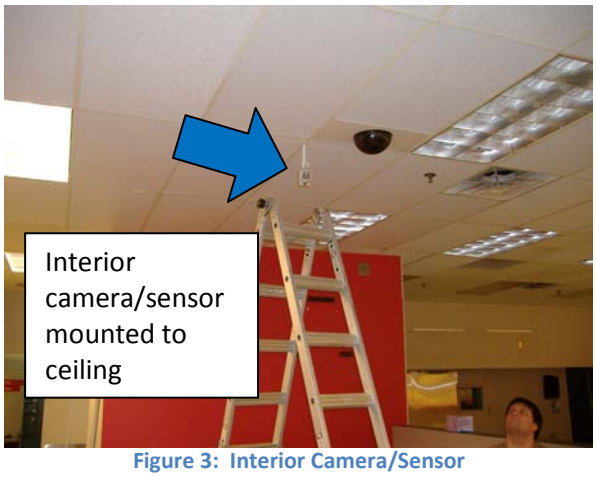


Figure 3: Interior Camera/Sensor

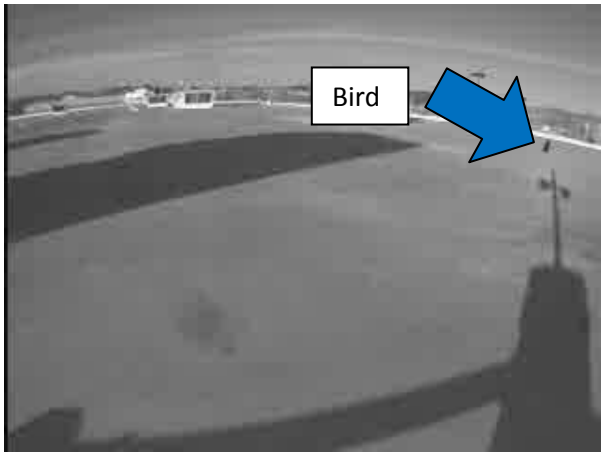
This photo shows the rooftop of the adjacent strip mall in the background.

Performance:

The system was installed October 14, 2008 and performed as expected. The cameras placed on the interior of the building consistently detected intrusions and sent videos as expected. The cameras placed on the rooftop also detected intrusion and sent videos as expected.

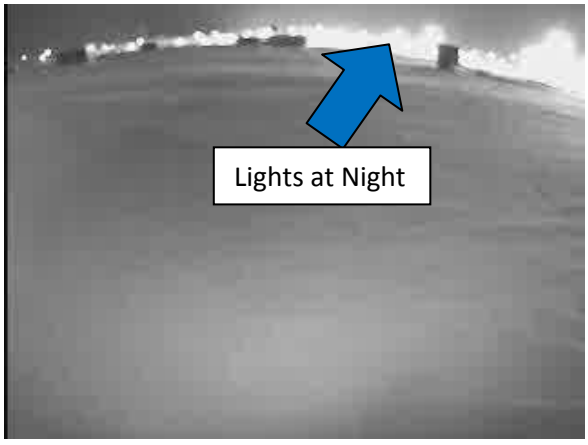
Once installed, the system performed as expected.

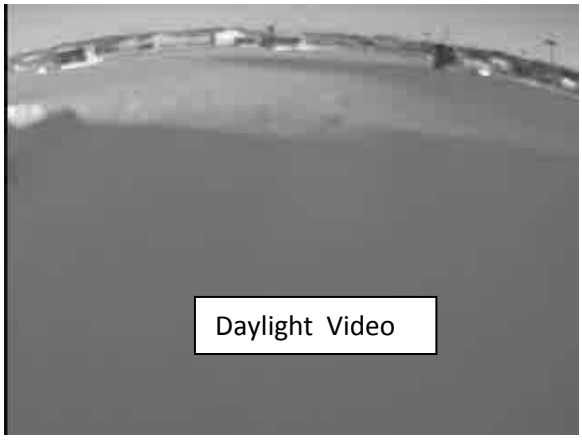
On November 26, there was a "detection" from a rooftop and the monitoring station followed procedures and dispatched police. The video showed a large bird walking around the roof. The police response to this incident was detected by the interior cameras and the video sent to the notification group.



Issue:

January 1, 2009 was extremely cold (-20F) with high winds, snow and blizzard conditions. On that night one of the rooftop cameras sent multiple videos of the empty rooftop and blowing snow. This was both puzzling and concerning. The outdoor camera/detectors have been proven to be stable in both thunderstorms and blizzards, even going through Hurricane Ike on the Gulf Coast. This was abnormal and was initially attributed to a defective camera/sensor.





This camera/sensor was replaced the second week of January. Shortly thereafter Minnesota experienced the coldest weather of the season (-25F) and there were again numerous video alarms sent from the new replacement camera/sensor. The replacement camera had been installed in exactly the same location as the previous camera that had begun sending videos on January 1. Throughout this period the other rooftop camera had given no activations despite being subjected to identical conditions as the problem cameras and being mounted within 12 inches from them on the same pole.

On January 14, a conference call was held to discuss the situation and the possible causes of the activations. Representatives from the integrator, Videofied and the Retailer participated. It was determined that the most likely thing that was happening was there actually was a heat source being detected and that the camera/sensors were performing properly. Possible heat sources proposed included:

- the lights and traffic seen beyond the roof in the videos sent by the cameras. Most of the videos were at night which made the lights seem somehow plausible.
- The HVAC system was somehow sending a plume of hot air during the coldest periods. This seemed plausible due to the fact that the activations seemed to happen during times of extreme cold and wind, which also occurred at night.

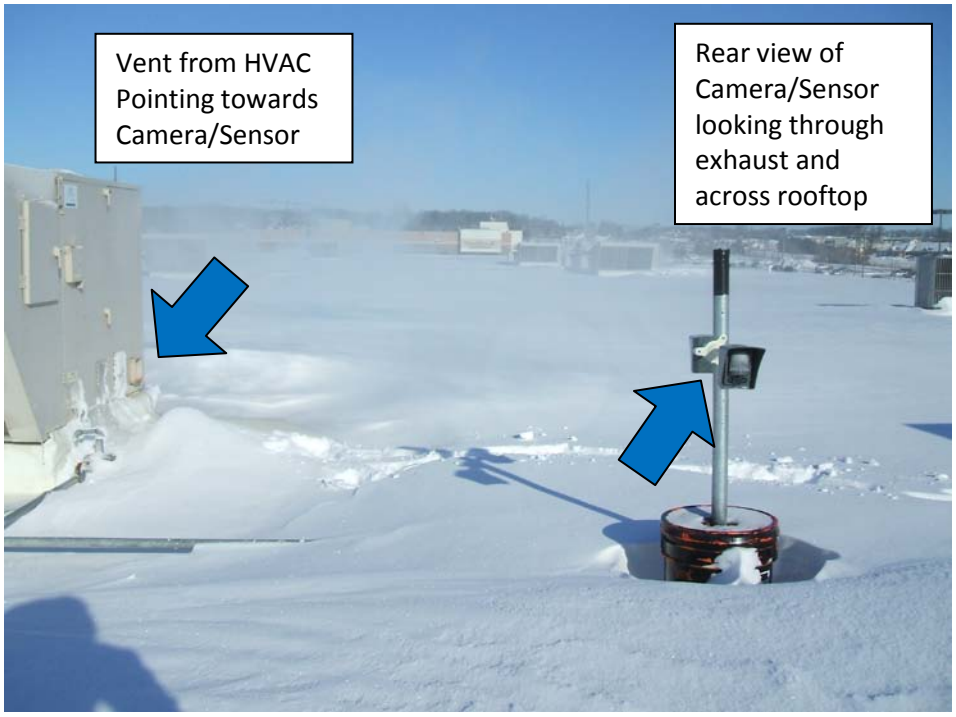
Resolved:

The integrator went to the sight January 15 to investigate the cause of the detections. What was encouraging was that as soon as security personnel reached the rooftop, the camera/sensors detected them and sent videos as expected. Before approaching system, security personnel tested both cameras and they functioned as expected. These two videos show the security personnel as they come across the roof at -22F. This is exceeded the specified operational range of the system.

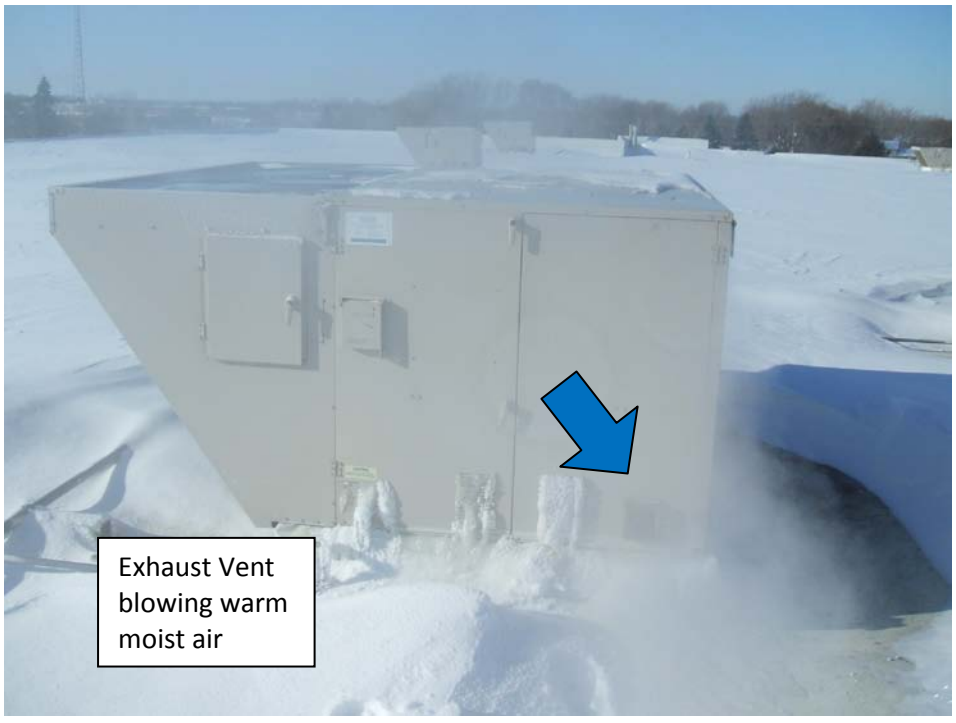
Figures 3: Video of Security Personnel on rooftop at -22F

Figures 4: Video of Security Personnel on rooftop at -22F

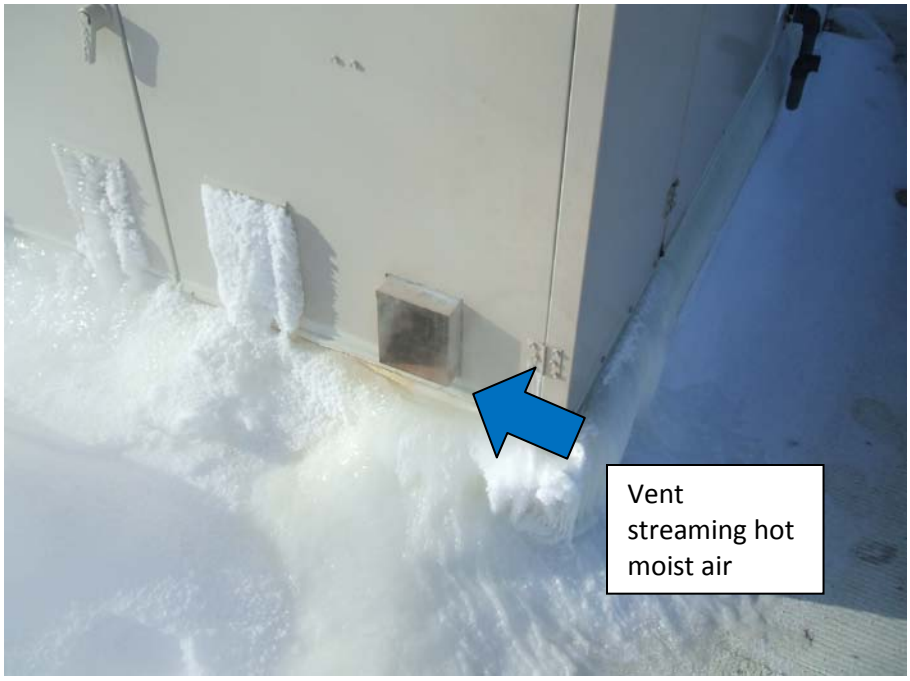
Once on site, the integrator found the cause of the PIR activations. The camera/sensors were installed 8-10 feet from a small exhaust vent on one of the HVAC units. This vent pumped out warm moist air in the direction of one of the camera/sensors, the one that was sending the videos.



Moreover, the camera that had not been active was pointed at the adjacent rooftop. It had been installed such that the motion sensor should not trip because of activity on the adjacent roof.



It was this unexpected venting of hot moist air that was causing the Passive Infrared Motion detectors to trip and activate the camera.



While inspecting the site the integrator noticed that there had been activity on the adjacent rooftop by repairmen as evidenced by fresh footprints all around their HVAC unit – Videofied detected the security personnel intrusion and ignored the activity on the adjacent rooftop as expected.

Upon reexamination of the video clips sent by the camera, especially the ones in the daylight, it became evident that much of what was thought to be “blowing snow” had in fact been the vapor-laden hot air from the exhaust vent that was being blown in front of the sensor/camera.

Conclusion:

The Videofied solution has performed as expected and delivered reliable protection in harsh outdoor environments down to -20F. It has not been a source of false alarms but reliably detected and provided videos of the detections using RF and cell networks. It can be installed anywhere without regard to AC power source or wiring.

The test was a success, exceeding expectations and operating beyond the specified limits.