

OSS
ORGANIZATION OF
SELF-INSURED SCHOOLS

REPORT

METAL THEFT PROTECTION

July 2012

OSS

ORGANIZATION OF

SELF-INSURED SCHOOLS

July 10, 2012

MEMORANDUM FOR: Larry Teixeira, OSS President

SUBJECT: Metal Theft Prevention

The purpose of this report is to provide the OSS districts with the known practical options to prevent metal theft on campuses including protection for solar energy generation units.

Contact has been made with a variety of people and organizations with expertise in this field. The following responses to the inquiries have been included in herein: Phil Combest, Senior Manager, Risk Services, Poms & Associates; Keenan Loss Control Special Bulletin; CASBO, California School Business Journal, Desperate Times and Campus Crimes; Terra Verde, Renewable Partners; Keenan, Energy Generation – Solar, Grid Lock Solar Security (GSS).

The following is a listing of ways noted in the afore mentioned documents that metal theft may be reduced:

1. Review the OSS insurance coverage.
2. Install the equipment in suitable locations.
3. Enlist the assistance of neighbors and law enforcement.
4. Consider manufacturer's warranties.
5. Consider design features.

Install:

- A. Alarms (monitored or signal).
- B. Invisible electronic beams.
- C. Local alarm systems.
- D. Surveillance systems.
6. Indelibly marking equipment.

7. Install tamper-resistant fasteners.
8. Establish a reward system.
9. Secure electric vaults with hardened pad locks. Keep locked at all times.
10. Fence-in transformers and conduit termination points with reinforced fencing.
11. Maintain adequate lighting around potential theft areas.
12. Install alarms and intrusion detection systems in vaults and junction rooms.
13. Employ a security patrol or on-site security guard.
14. Fence-in construction sites and enforce strict access control.
15. Do not store large amounts of copper on site, visible to the public.
16. Participate in business watch or similar programs.
17. Initiate a materials identification marking program.
18. Use of alternate bi-metal such as "Copperweld" .
19. Post appropriate signage near potential area.
20. Ensure campuses are well lit.
21. Follow through with prosecutions.
22. Increase security at times when the potential for vandalism increases.
23. Use tip lines.
24. Teach vigilance.
25. Install solar specific security.

I participated in a round-table discussion at a recent NCR risk management meeting with approximately twenty participants. The conclusion was that there is no "silver bullet." The unique needs of each district will determine which, if any, theft reducing measures will be most appropriate for its circumstances.

If you have any questions please contact me.

Henry Brock
Risk Manager



Poms & Associates

Insurance Brokers, Inc.

July 3, 2012

Dr. Henry Brock III
Organization of Self-Insured Schools (OSS)
10646 S. Bethel Avenue
Selma, CA 93662-9325

Dear Dr. Brock,

This letter is in response to your inquiry regarding management of risk exposures associated with theft of scrap metals in utility systems, particularly copper and other items with value in solar energy collection systems. We have performed some cursory research and compiled the information below for your consideration.

Theft of high value scrap metal, such as copper, has become a serious concern in recent years. There have been numerous reports of large theft losses in communities throughout the United States and California, including the San Joaquin Valley and Fresno areas, targeting electrical systems, air conditioning systems, and essentially any device containing a significant amount of metal that has scrap value. In some areas, entire air conditioning compressors have been stolen – some even using cranes to access and remove rooftop installations. In addition to theft losses, several would-be perpetrators have been injured or killed by electrical burns while tampering with live conductors. You and your member districts are commended for considering these concerns in your acquisition of new utility systems.

Theft and/or vandalism, specifically of solar collector panels, has become a more common occurrence over the past few years with crimes ranging from the brazen amateur, where panels were crudely ripped from their locations and posted for auction on eBay or Craigslist, to the sophisticated, where large numbers of panels were precisely removed and dismantled by someone with apparent expertise in solar panel construction (known as “photovoltaic theft”). Stolen equipment is being resold on the black market to unscrupulous installers or other interested parties. Targeted locations have ranged from commercial buildings to school districts to wineries. Unfortunately, risk management and product design has lagged behind the technology and opportunistic criminals, but stakeholders such as alarm companies, law enforcement, and device manufacturers are recognizing the problem and offering various solutions to consumers.



Compiled below is a short list of suggestions for you and your members to consider when selecting and installing solar panels or other equipment that may be targeted for scrap theft. In some of these suggestions, specific vendors and websites are named when describing various solutions. This is not to be construed as an endorsement of any particular vendor. Many of the products and services described are available from multiple vendors.

These suggestions are simply listed and are not necessarily in any particular order:

1. Ensure proper insurance coverage. Work with your insurance providers to confirm proper and complete coverage of equipment. Some policies may cover equipment for theft (subject to a deductible), but complete losses such as fire loss may not completely cover replacement of upgraded mechanical or utility systems. Supplemental coverage or policies may be advisable.
2. Use discretion when discussing or announcing the installation of high value equipment. Advertising the high value of your investment may prove to be alluring to would-be thieves and vandals, both professional and amateur.
3. Install equipment in suitable locations. Equipment that is in a remote area not easily observed from the public way or neighboring properties may be particularly susceptible to theft and vandalism. Applying the principles of Crime Prevention Through Environmental Design (CPTED) may serve to prevent and/or mitigate theft and vandalism losses. Note that placing equipment in conspicuous locations may be infeasible due to objections by neighbors, poor aesthetic appeal, or other logistical concerns such as regulatory/building codes, topography, or existing infrastructure orientation. Additional CPTED features may include alteration of lighting, landscaping, building orientation, fences, means of roof access, and similar features.
4. Enlist the assistance of neighbors. Alerting neighbors to the concerns may be a beneficial tool to combat theft and/or vandalism. If present, work with local groups such as Neighborhood Watch. (Contact your local law enforcement agency for specific information.) Consider participation in anonymous reporting programs such as WeTip (<http://www.wetip.com>). Request assistance and advice from your local law enforcement agency.
5. Consider warranties offered by manufacturers. Some equipment manufacturers may offer warranties protecting against vandalism or theft due to various design features to resist these threats.

6. Consider the design features of the equipment being installed. Some equipment designs incorporate features that are inherently theft-resistant. This includes concealed fasteners, concealed conductors, and tamper-resistant enclosures. Some equipment incorporates tamper-resistant fasteners and housings. When working with contractors and manufacturers, organizations should inquire specifically about features to resist theft and vandalism.
7. Consider installing theft deterrent devices on new and existing equipment. Many measures can be taken to reduce or mitigate losses from theft and vandalism, including but not limited to the following:
 - a. Alarms (monitored or signaled): Motion detectors/microwave sensors (tied into existing systems) may be relatively economical, but they may be impractical for outdoor applications due to the high number of false alarms. In addition, most alarm monitoring companies will resist monitoring such a temperamental system. Motion detectors could, however, trigger secondary systems, such as surveillance cameras, to provide an additional layer of intruder verification. (See Item C below.)

Invisible Electronic Beams (tied into existing systems) may be the best option for existing alarm enhancements. Invisible Electronic Beams could be installed in two or three rooftop areas where one would expect intruders. The beams typically have a range from 300 to 500 feet, which should more than meet the site needs. There are single beams, double beams, and variations that crisscross. The addition of a second (or third) beam greatly reduces the likelihood of false alarms because multiple beams must be crossed in order to activate an alarm signal. One downside is that if perpetrators figure out the system, it can be defeated. However, it would be unlikely to see that level of commitment or sophistication on the part of the trespassers/vandals, unless those trespassers/vandals were professionals or it was an inside job.

In our research, we found several variations of this type of equipment manufactured by TAKEX (<http://www.takex.com>) and Innovonics (<http://www.inovonics.com>). Any similar product would be sufficient. These companies appear to provide a wide variety of high-powered commercial components that are wireless, which can be useful in fortifying existing systems.

Creative Security of San Jose, California (<http://www.creativesecurity.com>), markets the "Snitch" system, a supervisory/monitored alarm system and service aimed specifically to combat copper wire and related thefts.

- b. Local Alarm Systems (not necessarily monitored): The benefit to this application is that it would immediately deter criminal activity. It would also alert neighbors, who would be expected to summon the police or other specified authorities. Gridlock Solar Security in Santa Rosa (<http://www.gridlocksolar.com>) offers a system that initializes a loud siren when the panels are disturbed. A local alarm system may incorporate any number of detection devices, but something specifically tied to the equipment being protected (such as magnetic contacts or running a trace wire) may be preferred to reduce the likelihood of false alarms. Downsides of this application include the fact that audible alarms may be a nuisance to neighbors and they may cause trespassers to flee in a panicked state, possibly disregarding their personal safety.
 - c. Surveillance Systems (cameras, recorders): These range from the simple to the elaborate. For outdoor applications, these may be easily defeated and vandalized by trespassers. They can be costly, but they could provide hard evidence to prosecute trespassers. Systems may also alert responders, designated monitors, etc. Systems may be designed and installed by professionals and monitored by paid central station monitoring services; there are also many low-cost, do-it-yourself systems that may be linked to dialers to summon on-call staff. Motion detectors may actuate camera systems that feed live video stream to a designated staff member's smart phone or a secure network IP address into which a designated person may log in. Passive recording systems may be installed to record and/or feed video to a remote hard drive storage location.
8. Consider indelibly marking the equipment. Permanent marking of equipment using stickers, engraving, or similar applications may assist in equipment recovery. CodeSource out of Denton, Texas (<http://www.codesource.com>) offers such technology, but this could be performed by the equipment owner/user. If this is done, make certain that such actions do not void any warranties or listings of the equipment. Ensure that all serial numbers are recorded and on file if needed for recovery efforts.

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9. Consider using tamper-resistant fasteners. Features such as one-way screws or locking bolts may prove to reduce equipment vulnerability. Some fasteners require uniquely cut tools or keys to remove them. Heliotex out of Palm Desert, California offers such fasteners (<http://www.solarpanelcleaningsystems.com/security-fasteners.php>), as does Bryce Fastener out of Gilbert, Arizona (<http://www.brycefastener.com>).

Organizations should conduct their own research to determine the suitability of various products and services in meeting their unique needs. Furthermore, in whatever solutions are considered, organizations should engage the services of a qualified professional in the specific area being explored.

Please let me know if I may assist further in this matter.

On behalf of Poms and ASCIP, thank you for the opportunity to support your ongoing safety, loss control, and risk management efforts.

Sincerely,

A handwritten signature in black ink, appearing to read "Phillip A. Combest" with a stylized flourish at the end.

Phillip A. Combest, CSP, ARM-P, ALCM, CPSI
Senior Manager, Risk Services

The Copper Theft Epidemic/Security Protocol Updated

BACKGROUND

Schools and businesses nationwide have been increasingly impacted by the copper theft epidemic. Economic growth and worldwide demand have driven copper prices from \$.40 per lb. in 2003 to over \$ 4.15 lb. pound in 2012 and Bronze/Brass to the same. Limited supplies have made the material a very attractive target for thieves. Theft of copper is on the rise again in 2012. Currently California is ranked the fourth highest metal theft state nationwide.

The following includes an overview on the Copper Theft Epidemic and Best Practices involving an assessment of a school districts' security protocol.

WHO STEALS COPPER AND BRONZE?

Open source surveys indicate that there are two basic types of copper thieves:

Type I: Drug addicted small time thieves are the most common offenders.

A survey of police department's nationwide shows the direct correlations between methamphetamine abuse and copper thefts. Typical Type I copper thieves steal copper to support their drug addiction. They employ a method know as "stripping". Basically they use crude tools and tactics to strip all the copper from your equipment, vaults, walls, etc. Stripping is very destructive and guaranteed to cause maximum damage and disruption at your site.

Examples:

- Ripping condenser coils out of HVAC units leaving them inoperable.
- Cutting and removing power lines leaving the site without power.
- Damaging and removing transformers, leaving equipment inoperable.
- Stripping live water lines, causing flooding and leaving the site without water.
- Bronze is stolen in the form of plaques, statues and building ornamentation.

Nationally, the areas with the highest reported numbers of methamphetamine abuse and copper theft are Hawaii, Arizona, **California**, and Oregon.

Type II: Sophisticated professional criminals.

Type II copper thieves are less common and tend to go for bigger scores. They target large spools of wire or bundles of pipe on utility trucks, at construction sites, or in storage yards. This material can be taken quickly and without the risk of being electrocuted or drawing attention. The amount of copper netted from these large scores makes them a lucrative target. The material is commonly recycle or re-sold as new material to unknowing victims.

Type II thieves typically strike with precision and aforethought. If Type II thieves do engage in stripping, it is on a large scale, netting hundreds or thousands of pounds of material with the use of large trucks and sophisticated tools.

FACT: Methamphetamine reduces the brain's ability to assess risk before taking action. Thus, the danger associated with cutting live high voltage wires will not detour a determined methamphetamine addict.

CURRENT REMEDIES: AT&T has opened a \$10,000 reward program. NCR has its own reward program. Still, law enforcement has not devoted the resources to policing the recyclers who knowingly accept contraband metals. Efforts are underway to establish a 2-day "cooling off" period for payments by those recyclers, so that the source of the salvaged goods can be verified.

FACTORS

The Office of Electricity Delivery and Energy Reliability U.S. Department of Energy (OE) reports that copper theft is less prevalent in areas without nearby scrap dealers. A thief is less likely to steal a small amount of copper if the nearest scrap dealer is far away. As a result, copper thieves tend to target sites in cities or suburbs rather than rural areas.



The Police departments in warmer climates such as Southern California and Florida report higher numbers of copper thefts less than 100 lbs. These thefts are typically perpetuated by transients without the use of vehicles. As previously mentioned, these smaller thefts are typically linked with methamphetamine abuse.

SAFETY CONSIDERATIONS

Aside from the monetary impact of copper theft there is a serious associated danger. District employees, students or the public can be injured or killed by touching energized wires or equipment that is exposed when thieves cut fences, locks, and wires. This is especially problematic at schools where students could unknowingly encounter lethal high voltage.

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WHAT'S BEING DONE

The Institute of Scrap Recycling Industry (**ISRI**) is assisting the scrap metal industry in identifying stolen material through its Scrap Theft Alert system. Whenever ISRI learns of a major scrap theft, it sends an e-mail notice to scrap recyclers in the state where the theft occurred as well as in surrounding states. The alerts include a description of the stolen material, serial numbers and photos of the material (when available), and contact information for local and/or state law enforcement officials. ISRI has also established recommended practices and procedures for minimizing the risks of purchasing stolen scrap metal.

Recently many states have recognized the need to pass laws increasing copper theft penalties. In Feb 2007 California initiated A.B. 1372 which adds the theft of copper materials as a type of theft punishable as a grand theft (felony).

BEST PRACTICES

Although it is impossible to completely insulate your site from copper thieves, there are some proactive steps you can take to reduce the possibility of being hit. Primarily you should try to eliminate “crimes of opportunity” by taking the following actions:

- Secure electric vaults with hardened pad locks. Keep locked at all times.
- Fence-in transformers and conduit termination points with reinforced fencing.
- Maintain adequate lighting around potential theft areas.
- Install alarms and intrusion detection systems in vaults and junction rooms.
- Use video surveillance whenever possible.
- Employ a security patrol or on-site security guard.
- Fence-in construction sites and enforce strict access control.
- Do not store large amounts of copper on site, visible to the public.
- Develop a close relationship with local law enforcement.
- Participate in business watch or similar programs.
- Initiate a materials identification marking program.
- Use of alternate bi-metal materials such as “Copperweld”.
- Post appropriate signage near potential area.



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DESPERATE TIMES & CAMPUS CRIMES

Increase in campus theft, vandalism is pick-pocketing district budgets

By Julie Phillips Randles

DESPERATE TIMES HAVE LED SOME TO TAKE DESPERATE MEASURES, with school sites statewide becoming the targets for the theft of everything from copper wire to bus batteries. These crimes are hitting campuses at a time when districts have less money and fewer resources than ever to focus on security, replace stolen items or repair the damage caused by thieves and vandals.

The theft of copper wire and heavy metal objects such as HVAC systems, water fountains, manhole covers and water meters has become pervasive across the state for both municipalities and school districts, according to recent reports in *The Sacramento Bee*. In a move usually reserved for crackdowns on gangs or drug sales, the city of Sacramento recently established a task force with a singular focus on copper theft. The city has spent nearly \$900,000 not only replacing copper wire and other metal objects that have been stolen in recent months, but also hiring outside contractors to deal with the growing problem.

School campuses are reportedly seeing similar thefts, along with increased vandalism, classroom break-ins and even some

overnight stays by the homeless who are looking for safe shelter.

The uptick in campus-based crimes coincides with the start of The Great Recession, according to several CASBO members who work in the business services, facilities, maintenance and operations, and risk management disciplines.

"The economy went down and theft went up," explained Todd Butcher, director of construction for Santa Ana Unified School District, and a CASBO member.

In a district the size of SAUSD, the cost of theft and required repairs when crime spikes can be several hundred thousand dollars, Butcher said.

COPPER WIRE, METAL THEFT

The rising value of metals means thieves nationwide are stripping copper wiring from utility poles and air conditioning units, prying brass plaques from monuments and plucking drains from wastewater pipes, then selling the items at recycling centers.

DESPERATE TIMES & CAMPUS CRIMES

Schools statewide are seeing copper wire being stripped from air conditioning units, portable buildings and stadium lights. Last year in San Juan Unified School District near Sacramento, district schools were targeted by copper wire thieves a dozen times in six months, causing a districtwide damage tally due to copper theft of \$100,000.

We've actually seen a decrease (in crime) because of our surveillance system. Everyone knows it's out there. We have been very successful using it and prosecuting with it.

Judy Miller, risk manager for the Perris Union High School District and chair of CASBO's Risk Management Professional Council, said one school in her district was the target of thieves who stripped the copper wire from every single stadium light.

The air conditioning units on some of the district's portables were also targeted, prompting the district to install fences around the units, Miller explained.

While some districts have not experienced copper wire thefts, they are still aware of the trend and are finding ways to be vigilant in preventing or responding to such activity.

Rich Buse, purchasing director for Pajaro Valley Unified School District and vice president of CASBO, said copper wire theft hasn't been an issue at his district, but his staff is monitoring the trend. "It's been mentioned, we are aware of it and our maintenance department is on top of it."

Dry Creek Joint Elementary School District in Roseville has had its share of copper theft, as have several other Northern California school districts, said Roger Van Putten, chief fiscal officer and a CASBO member. But he was pleased to share that the wire thief at one school site was caught, prosecuted and is now serving 250 days in jail after being identified on security video. The district is also expecting to receive some financial restitution in the case.

STEADY STREAM OF BREAK-INS

General theft and vandalism is an ongoing problem for districts statewide, with some saying break-ins have increased in the

last three years and others indicating that it's more of a steady stream, with the targeted items changing.

Miller said Perris Union has seen a crime increase in the last six months, with more to come if the economy continues to lag. "Sometimes you can barely keep up, and it's hard to project what's coming next," Miller added.

Santa Ana's Butcher said he feels fortunate that his district has its own police department, and added that elevated campus theft rates have led to increased patrols.

Laptops and iPads are key targets for thieves, while student stores, snack bars and metal storage containers at school sites are good marks for crash-and-grab break-ins where the bad guys net cash, athletic equipment, grounds' equipment or emergency supplies.

Also on the thieves school-site theft list – catalytic converters from cars parked in school lots, bus batteries and stockpiled emergency equipment.

Dry Creek Joint Elementary School District is bucking the break-in trend and has actually seen a decrease in site-based crime, according to Van Putten. He attributes the decline to the district's video surveillance system which is in place at nine of the district's 10 schools. The system was funded through a 2008 bond measure.

"We've actually seen a decrease because of our surveillance system," Van Putten described. "Everyone knows it's out there. We have been very successful using it and prosecuting with it."

Butcher says security cameras in his district are having the same effect, and estimates that vandalism and graffiti has been reduced by 90 percent on campuses due to the use of surveillance cameras.

THE TROUBLE WITH TECHNOLOGY

Touting that your district has the latest technology, or that new technology is being delivered to campuses, can be a double-edged sword. Sure, students and parents are pleased to hear the news, but such announcements can be akin to advertising to thieves that the latest and greatest is available in your school buildings.

"Word gets out that you have great technology and it can encourage robbery," Miller explained. In her district, three people were able to take 13 iMacs in six minutes. Police responded quickly, but they still weren't fast enough to stop the theft. Some computer labs have been targeted multiple times.

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DESPERATE TIMES & CAMPUS CRIMES

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When it comes to technology, employing multiple security layers is key to curtailing theft. Train staff to store laptops and iPads in lockable cabinets or to place them on carts and store them in a secure location like a principal's office, Buse suggested.

Also, ask staff to keep computers and other valuables away from windows. "We want computers on a solid wall," Butcher said. "We arrange classrooms so windows are not easily available to do a crash-and-grab."

We want computers on a solid wall. We arrange classrooms so windows are not easily available to do a crash-and-grab.

Miller recommended installing safety screens on computer lab windows to further prevent theft. These screens, which are welded to the window frame, prevent thieves from being able to remove items from classrooms even if they break window glass.

Finally, instruct staff who respond to thefts to call law enforcement first, and then make calls to the appropriate district staff – a new protocol introduced in Miller's district to speed response to site theft and vandalism.

AN INSIDE JOB

Tough economic times can also cause an uptick in internal theft, with district employees becoming the criminals.

"So many people are struggling and you may think they are fine, but even though they are working, they are struggling. Even employees may be stealing in these times, and that's unfortunate," Miller explained.

If computers and other equipment are being delivered to schools, and then disappearing before reaching classrooms, an employee may be to blame.

Districts which suspect that thefts of equipment or supplies may be an inside job should consider installing surveillance cameras in areas where valuable supplies and equipment are kept.

RISK MANAGEMENT'S ROLE

Cuts to risk management staff due to tight school budgets may also play a role in the campus crime uptick. In many districts, the



loss of the risk manager means other employees are taking on that role, in addition to their usual job duties, Buse noted. Everyone is spread thin and security issues and training are easily overlooked.

The savings from reducing risk management staffing can come back to haunt districts which are forced to take a reactive stance on theft and vandalism rather than addressing the issue proactively, Miller believes.

"You can get rid of all of us and you won't notice for a while, and then it will bite you," Miller said. "When you don't have the money, you end up being reactive instead of proactive. You end up paying either way."

STEPS TOWARD PREVENTION

Our experts shared their top tips for reducing or preventing campus-based crime. The leading recommendations – be sure that campuses are well lit and invest in high-definition surveillance cameras.

When you don't have the money, you end up being reactive instead of proactive. You end up paying either way.

Despite recent research that suggested dark campuses are less attractive to vandals, Butcher says experience has taught him that well-lit campuses are safer for the community and likely reduce theft and vandalism.

"I believe our district has a moral obligation to community members to have enough light to walk safely," Butcher said.

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DESPERATE TIMES & CAMPUS CRIMES

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Further, responding law enforcement need light to track down offenders and, on campuses with video surveillance, proper lighting means better data can be captured on video.

Additional suggestions for improving campus security include:

Expand monitoring services.

Add "intrusion coverage" to the fire alarm monitoring system that districts are already required to have in place. Packaging intrusion alarm services and monitoring together can keep costs down. Another option, hire information technology or classified employees to monitor district surveillance cameras during the overnight hours.

Partner with law enforcement.

If your district does not have a police force, partner with local law enforcement agencies to help monitor campuses and respond to frequently vandalized areas.

Follow through with prosecutions.

If your district does catch a thief on video or on site, be sure to follow through and prosecute the perpetrator. "Word gets out real quick" that the district will take action, Van Putten explained.

Identify areas on campuses that are vulnerable.

If computer labs are repetitively targeted by thieves or poorly lit areas are regularly vandalized, warn site staff and custodial employees of these vulnerable areas. Increase lighting and monitoring of these locations.

Inform the community.

If your district has a video surveillance system and other forms of security, be sure the community knows that sites are well-monitored. "That's one of the biggest deterrents we've got," Van Putten said.

Alarm buildings by wings.

Train maintenance and custodial staff to only disarm the security alarms for the wings or buildings where they are working, leaving the other buildings at the site alarmed.

Teach vigilance.

Remind teachers that they can play a role in school security by being sure doors are being fully closed and locked. In some

instances, students have prevented doors from closing securely by blocking latches with paper or gum, allowing building alarms to be set, but leaving individual doors unsecured.

Inspect storage sheds and containers.

Be sure sheds and large containers where supplies and equipment are stored have effective locks and that they are being properly secured at the end of each day.

Engage the community.

In communities where those living near schools see campuses as "theirs," vandalism and break-ins are reduced, explained Randall Rowles, executive director of facilities at Capistrano Unified School District. Take steps to engage neighbors in the idea that public school campuses belong to the community. Provide homeowners living near school sites with contact information for the appropriate district staff, Buse suggested. Ask neighbors to be particularly vigilant in watching campuses during breaks as crime increases when campuses are vacant.

Increase security at times when the potential for vandalism increases.

When high school graduation rolls around, vandalism at campuses tends to increase. Prevent the uptick by assigning additional security staff – perhaps overnight – to district high schools to ward off senior pranksters.

Use tip lines.

Perris Union has had success catching campus criminals by using WeTip Inc., an anonymous tip line that allows students, family, staff and the general public to report vandalism and other campus crimes without fear of compromising their identity. In addition to the toll-free phone line, WeTip provides fliers for schools to distribute when seeking information about specific incidents. ■■■

Julie Phillips Randles is a freelance writer based in Roseville, Calif.

Do you have an opinion or a comment on this article? *California School Business* magazine welcomes "Letters to the Editor." Please send your letters to kevins@casbo.org. All letters are edited for content, space and style considerations.

To: Mr. Henry Brock, Brock's Loss Control Services
From: Ali Chehrehsez, TerraVerde Renewable Partners
Subject: PV Module & Wire Theft Risk Reduction
Date: July 10, 2012



What School Districts Should Consider to Reduce the Risk of PV Module & Wire Theft

Photovoltaic (PV) systems are comprised of valuable equipment and material including PV modules, inverters, and copper wire. Therefore security and protection of the equipment is of utmost important to all PV system owners, including school Districts. While (central) inverters are less prone to theft due to their size and installation, PV modules and copper wires are more vulnerable to theft. Stolen PV modules can be sold in black markets and copper wires are sold at junk yards. To reduce the risk of theft of these high value commodities, school Districts would need to take multiple criteria into consideration and make a selection based on a life cycle cost vs. benefit analysis, prior to hiring a contractor to build the PV systems.

Generally, elevated PV systems (i.e. roof mounts and shade structures) have a lower likelihood of theft due to reduced accessibility. However, often there is not sufficient space available for roof mount installation, and the higher cost of shade structures make them somewhat less attractive compared to ground mount installations. The following three recommendations are presented for consideration, as they pertain directly to theft prevention of PV modules and copper wires for ground mount installations. However, they do also apply to roof mount and shade structure installations.

1. Wire Management

Wire management is a simple and low cost method for protecting wires from theft. Protected and hidden wires are less likely to be stolen by simply being out of sight. School Districts should request their contractors to tuck away loose wires using UV rated zip ties, run wires inside protective channels, and secure wire bundles to the PV module racking.

2. Mechanical Fasteners

PV modules are typically attached to the racking equipment with use of nuts and bolts. While there are multiple pairs of nuts and bolts attaching a PV module to the racking equipment, a school District may want to consider replacing some or all of the nuts and bolts with odd shaped screw heads or rivets. Such modification will increase installation cost and time, but it will certainly hinder any effort to remove the PV modules.

3. Current Continuity Detection

There are two types of current continuity detection solutions available which will detect theft and tampering with PV modules and wires.

In the case of PV modules, a dedicated wire is run through the frame of each PV module and connected to a power source. The power source continuously runs a current through the wires to ensure connectivity. If a wire is cut to remove a PV module, then the current interruption would trigger an alarm. The alarm could sound a horn, light strobes, or even notify the school District and law enforcement.

In the case of wires, combiner boxes have recently been introduced which include a continuous current detection at the string level. A string level is referred to a bundle of PV modules (usually 12-14) which are connected and terminated in a combiner box. Similar to the previous case, the combiner box continuously runs a current through the wires to ensure connectivity. If a wire is cut or tampered with, the system will detect the interruption and trigger an alarm.

Additionally, the following measures are included for general consideration, but are excluded from this report since they relate to overall security and protection of the PV systems:

1. Insurance Coverage
2. Security Patrol
3. Surveillance & Monitoring Systems
4. Intrusion Detection

In summary, there are multiple specifications which a school District should consider prior to hiring a contractor to build the PV systems. Specifically, in the case of security and theft prevention, it is very important to consider the cost vs. benefit of all available options before making a decision on final design of the PV systems.

This report is prepared by TerraVerde Renewable Partners (“TVRP”) for Brock’s Loss Control Services. The intent of this report is to provide a general guidance regarding PV module and wire theft risk reduction for school Districts.

TVRP creates energy saving opportunities for school districts, local, state and federal governments, and non-profit organizations. TVRP’s comprehensive approach to planning and implementing programs in solar electricity generation, energy efficiency upgrades and demand management, provides clients smart ways to reduce electricity costs (www.tvrpllc.com).



GridLock Solar Security (GSS) has developed a strong deterrent to PV module theft.

GSS attaches each module to the security system in such a way that is virtually impossible to defeat without damaging the modules.

GSS says they will be protected 24 hours a day.



WHAT IT DOES

GridLock has a proprietary theft logic algorithm that is easy to install and difficult to defeat.

The GridLock system has a back-up battery that ensures that the system will operate even if utility power is absent.

A security lockout key that allows only authorized personnel to disable and access the alarm system.

WHAT IT DOES – PART 2

A security tamper resistant access panel that protects the control system and further deters potential theft.

Auxiliary control relays to allow for the operation of external devices such as cameras, video, and more.

Five separate cable loops that will protect .