

ECAM

PROTECTING CRITICAL INFRASTRUCTURE. REDUCING OPERATIONAL RISK. STRENGTHENING RESILIENCE.

A Proactive Security Guide for Energy & Utility Organizations

WHAT'S HAPPENING IN ENERGY & CRITICAL INFRASTRUCTURE?

Energy and utility organizations face a unique security challenge. Unlike traditional commercial properties, the assets they protect directly impact public safety, operational continuity and essential services.

Substations, transmission facilities, tower corridors, utility yards, renewable energy sites, water treatment facilities and remote infrastructure locations are increasingly targeted by trespassers, copper thieves, vandals, organized criminal groups and other unauthorized suspects. While theft remains a concern, the consequences often extend far beyond property loss.

A single incident can result in equipment damage, service disruptions, emergency response costs, regulatory scrutiny and outages that affect entire communities. At the same time, many organizations struggle to secure large, geographically dispersed assets with limited staffing and visibility.

What makes critical infrastructure security different is that the incident itself is often only the beginning. Security teams must coordinate investigations, support law enforcement, document events and provide evidence that can withstand legal and regulatory scrutiny.

This guide explores the evolving risks facing energy and critical infrastructure organizations and outlines how proactive monitoring, rapid response and actionable incident documentation can help reduce operational risk, strengthen resilience and support investigations before, during and after an incident.



BY THE NUMBERS

1,700+
SECURITY INCIDENTS
Reported across U.S. energy infrastructure annually

71% INCREASE IN GRID SECURITY INCIDENTS
Resulting in measurable outages since 2021

$1 BILLION+
ANNUAL COPPER THEFT COSTS
To U.S. businesses and infrastructure operators

100+ INCIDENTS AFFECTING THE U.S. ELECTRIC GRID
Annually

160+ REPORTED PHYSICAL ATTACKS & VANDALISM EVENTS
Targeting electrical infrastructure annually

180+ THREATS OR ATTACKS AGAINST GRID INFRASTRUCTURE
Reported by U.S. power providers annually

*https://www.ncsl.org/energy/human-driven-physical-threats-to-energy-infrastructure
**https://www.ncta.com/wp-content/uploads/2025/04/Vandalism_2025_Report.pdf
***https://circleid.com/posts/the-high-price-of-copper-theft-a-growing-problem-with-costly-consequences
****https://www.axios.com/2023/03/08/power-grid-physical-security-attacks-alarm
*****https://www.asisonline.org/security-management-magazine/latest-news/today-in-security/2023/january/substation-attacks-heighten-scrutiny-electric-grid-risks/
******https://www.activu.com/the-rising-threat-to-u-s-power-grids-and-how-utilities-are-fighting-back/

CRITICAL INFRASTRUCTURE IS A HIGH-VALUE TARGET

Energy and critical infrastructure environments are designed to deliver essential services, not function as traditional security sites. Large geographic footprints, remote facilities, critical equipment and limited staffing create unique challenges that make these environments attractive targets for theft, vandalism, trespassing and other unauthorized activity.

The consequences of security failures extend far beyond the site itself. An intrusion at a substation, utility yard or water facility can impact operations, emergency response, public safety and service continuity across entire communities.



VULNERABILITIES

- **Remote sites:** Large, unmanned facilities with limited oversight.
- **Critical equipment:** Copper wire, copper grounding, substation transformers, tower corridors and infrastructure components incur exorbitant damage and repair costs.
- **Geographic spread:** Hundreds of facilities across broad service territories.
- **Limited staffing:** Security teams responsible for multiple sites simultaneously.
- **Evidence gaps:** Delays obtaining the information needed to support investigations.

THREATS

- **Copper theft:** Theft of grounding wire, cable and other infrastructure materials.
- **Unauthorized access:** Trespassing at substations, utility yards and critical facilities.
- **Vandalism and sabotage:** Intentional damage to infrastructure and equipment.
- **Vehicle incursions:** Accidental or deliberate perimeter breaches.
- **Protest activity:** Demonstrations, labor disputes and site disruptions.

RISKS

- **Service interruptions:** Incidents that impact operational continuity.
- **Operational downtime:** Equipment damage requiring repairs and restoration.
- **Public safety exposure:** Increased risk to employees, contractors and communities.
- **Regulatory scrutiny:** Reporting and compliance consequences following incidents.
- **Investigation delays:** Missing or incomplete incident documentation.
- **Financial impact:** Repair costs, emergency response expenses and liability exposure.

Traditional security systems may document incidents after they occur, but critical infrastructure organizations need solutions that support the entire incident lifecycle, from detection and response to documentation, investigation and resolution.

FIVE SIGNS YOUR CRITICAL INFRASTRUCTURE SECURITY ISN'T KEEPING UP

Energy and utility organizations face security challenges that extend beyond traditional theft prevention. The ability to detect incidents quickly, document them thoroughly and support investigations effectively can have a direct impact on operations, resilience and public safety.



1. INCIDENT DOCUMENTATION TAKES DAYS OR WEEKS TO RECEIVE

- When evidence is delayed, investigations lose momentum and opportunities to identify suspects can be missed.

2. YOUR SECURITY PROGRAM STOPS AT DETECTION

- Alerts are generated, but response, documentation and follow-through remain fragmented across multiple teams.

3. LAW ENFORCEMENT DOESN'T RECEIVE COMPLETE INFORMATION QUICKLY

- Delayed or incomplete evidence can slow investigations and reduce opportunities for warrants, arrests and prosecution.

4. REMOTE SITES HAVE LIMITED VISIBILITY

- Critical infrastructure is often spread across dozens or hundreds of facilities with minimal on-site staffing.

5. SECURITY INCIDENTS CREATE OPERATIONAL CONSEQUENCES

- The concern is not simply theft; it is service disruptions, downtime, safety concerns and increased operational risk.

If even one of these gaps feels familiar, it may be time to evaluate how your organization manages incidents from detection through resolution. Consider strengthening your approach with proactive monitoring, rapid documentation and solutions designed to support investigations, reduce operational risk and protect critical infrastructure. At ECAM, we provide scalable solutions built specifically for utility and critical infrastructure environments.

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CASE STUDY

HOW SOUTHERN CALIFORNIA EDISON STOPPED COPPER THEFT WITH ECAM

THE CHALLENGE

Southern California Edison (SCE), one of the nation's largest electric utilities, was facing repeated break-ins and copper theft at one of its electrical substations. Criminals were cutting holes in perimeter fencing to steal copper grounding wire from transformers, creating serious operational and safety concerns.

Beyond the cost of repairs and replacement materials, each incident increased the risk of electrical surges, equipment damage, fires and potential outages that could impact customers across the grid. Traditional security measures, including passive CCTV cameras and on-site patrol guards, proved ineffective as intruders learned to exploit patrol gaps and avoid detection.

THE SOLUTION

ECAM implemented a proactive, technology-driven security strategy designed to prevent theft before it could occur. The solution included:

- enhanced surveillance coverage using fixed cameras and mobile surveillance units (MSUs);
- photoelectric beam technology to create a virtual perimeter around the facility;
- 24/7 monitoring through ECAM's UL-Listed, TMA Five Diamond Certified Monitoring Center;
- real-time response capabilities including sirens, strobe lights and two-way voice-down communication.

This layered approach created a continuous security presence that eliminated predictable patrol patterns and improved visibility across the site.

THE RESULTS

- **Rapid** detection and verification of unauthorized access attempts
- **Successful** deterrence through real-time intervention and communication
- **Enhanced** protection of critical infrastructure assets
- **Improved** safety by reducing the risk of equipment damage and service disruption
- **Reduction of up to 70%** in overall security costs compared to traditional guard-based approaches
- **Significant** reduction in copper theft activity at the site

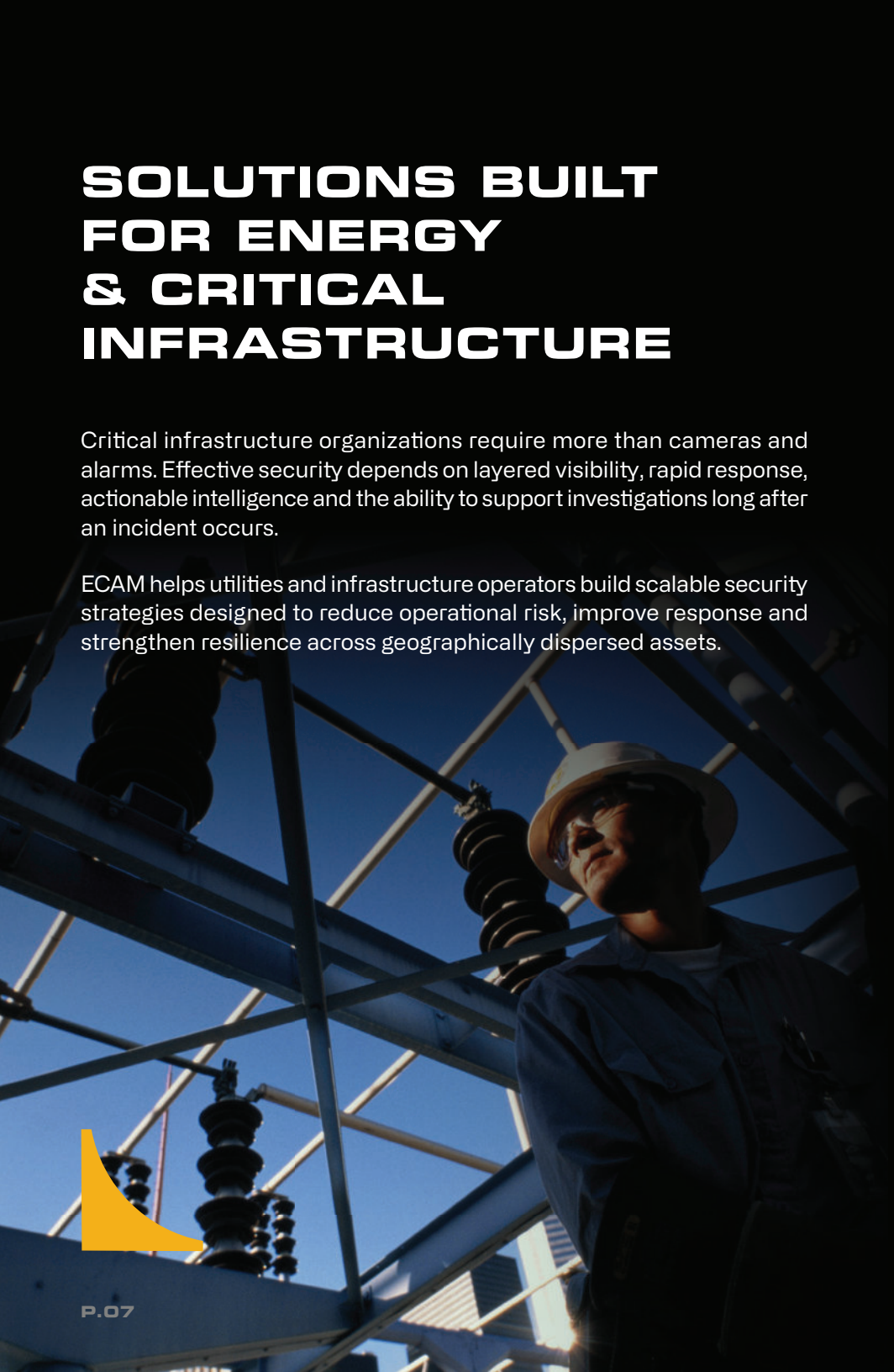
KEY TAKEAWAY

For energy and utility organizations, the impact of theft extends far beyond property loss. By combining proactive monitoring, real-time intervention and comprehensive site visibility, ECAM helped Southern California Edison reduce operational risk, strengthen infrastructure protection and significantly lower security costs while helping prevent future copper theft incidents.

SOLUTIONS BUILT FOR ENERGY & CRITICAL INFRASTRUCTURE

Critical infrastructure organizations require more than cameras and alarms. Effective security depends on layered visibility, rapid response, actionable intelligence and the ability to support investigations long after an incident occurs.

ECAM helps utilities and infrastructure operators build scalable security strategies designed to reduce operational risk, improve response and strengthen resilience across geographically dispersed assets.



PERMANENT SURVEILLANCE SYSTEMS

- Monitor substations, utility yards and critical facilities
- Support visibility across high-risk infrastructure assets
- Capture detailed evidence for investigations and reporting
- Improve awareness across remote locations

MOBILE SURVEILLANCE UNITS (MSUs)

- Rapid deployment for remote sites and temporary projects
- Ideal for construction, expansion and maintenance operations
- Flexible protection where permanent infrastructure is unavailable
- Visible deterrence for theft and unauthorized activity

LIVE VIDEO MONITORING

- Enables real-time intervention during incidents
- Supports rapid escalation and response
- Provides visibility during overnight and after-hours periods
- Helps reduce operational risk before disruption occurs

AI-DRIVEN ANALYTICS

- Detect perimeter intrusions faster
- Reduce false alarms and unnecessary dispatches
- Prioritize real threats for immediate review
- Improve visibility across large-scale operations

LICENSE PLATE RECOGNITION (LPR)

- Capture license plates to assist with suspect and vehicle identification
- Support investigations and evidence collection
- Enhance perimeter security programs
- Strengthen accountability and access oversight

INCIDENT DOCUMENTATION & SYNCHRO REPORTS

- Deliver complete incident packages quickly
- Include images, video, timelines and event documentation
- Support investigations, warrants, bail hearings and court proceedings
- Help move incidents from detection to resolution faster

By combining proactive monitoring, advanced detection and comprehensive incident documentation, energy organizations can move beyond traditional security and build a more resilient approach to protecting critical infrastructure.



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CONSIDER THE NUMBERS

Surveillance cameras can reduce thefts
BY UP TO 45%

Sensors, LPR and real-time monitoring can cut crime
BY UP TO 60%

Surveillance footage helps identify suspects
IN 70% OF THEFT CASES

**https://zipdo.co/parking-lot-crime-statistics/#sources



ENERGY & CRITICAL INFRASTRUCTURE SECURITY CHECKLIST

Creating an effective critical infrastructure security strategy requires more than adding cameras or increasing guard coverage. Organizations need a proactive approach that improves visibility, accelerates response and supports the full incident lifecycle.



1. IDENTIFY CRITICAL ASSETS AND HIGH-RISK SITES

- ☐ Prioritize substations, utility yards, tower corridors and remote facilities
- ☐ Evaluate perimeter exposure and visibility gaps
- ☐ Assess operational and service continuity risks

2. STRENGTHEN PERIMETER VISIBILITY

- ☐ Deploy layered surveillance coverage
- ☐ Reduce blind spots across critical facilities
- ☐ Improve awareness of after-hours activity

3. ESTABLISH RESPONSE PROTOCOLS

- ☐ Define escalation procedures for incidents
- ☐ Coordinate security, operations and emergency response teams
- ☐ Ensure rapid intervention when threats are detected

4. ACCELERATE DOCUMENTATION & REPORTING

- ☐ Standardize incident reporting workflows
- ☐ Improve evidence collection and organization
- ☐ Support regulatory, legal and investigative requirements

5. MEASURE OPERATIONAL IMPACT

- ☐ Track prevented incidents and operational savings
- ☐ Measure response effectiveness
- ☐ Quantify improvements in resilience and risk reduction

By starting with a clear understanding of operational risk, deploying the right mix of technologies and establishing scalable incident management processes, energy organizations can move from reactive security to a more resilient, proactive approach. The result is stronger infrastructure protection, faster investigations and improved operational continuity.

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YOUR PATH TO STRONGER CRITICAL INFRASTRUCTURE PROTECTION

Energy and critical infrastructure organizations face increasing pressure to protect essential assets, prevent disruptions and respond effectively to security incidents. As facilities become more distributed and threats become more sophisticated, traditional security approaches are no longer enough.

Effective infrastructure protection combines proactive monitoring, rapid response, actionable evidence and comprehensive incident documentation to support the entire incident lifecycle. When implemented strategically, these solutions help organizations reduce operational risk, accelerate investigations, strengthen resilience and better protect the communities they serve.

TAKE ACTION WITH ECAM

Protect critical assets, reduce operational risk and improve incident response with security solutions built specifically for energy and critical infrastructure environments. ECAM provides scalable technology, proactive monitoring and comprehensive reporting designed to help organizations secure their facilities and strengthen operational resilience.

