SENSTAR™

NERC CIP-014 Compliance Guide

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The purpose of the NERC CIP-014 reliability standard is to protect electrical facilities from physical attacks that could threaten the stability and operation of the electric grid distribution system.

Requirement R5 mandates that operators implement physical security measures designed to collectively Deter, Detect, Delay, Assess, Communicate, and Respond to potential threats and vulnerabilities.

Senstar, with its wide portfolio of perimeter intrusion detection sensors, video management software and video analytics, can provide effective, field-proven solutions that assist operators in satisfying NERC CIP-014 recommendations.

CIP-014-2 Standard: Physical Security

To identify and protect Transmission stations and Transmission substations, and their associated primary control centers, that if rendered inoperable or damaged as a result of a physical attack could result in instability, uncontrolled separation, or Cascading within an Interconnection.

Requirement 5 – Each Transmission Owner that identified a Transmission station, Transmission substation, or primary control center in Requirement R1 and verified according to Requirement R2, and each Transmission Operator notified by a Transmission Owner according to Requirement R3, shall develop and implement a documented physical security plan(s) that covers their respective Transmission station(s), Transmission substation(s), and primary control center(s).

The physical security plan(s) shall be developed within 120 calendar days following the completion of Requirement R2 and executed according to the timeline specified in the physical security plan(s).

The physical security plan(s) shall include the following attributes:

5.1. Resiliency or security measures designed collectively to deter, detect, delay, assess, communicate, and respond to potential physical threats and vulnerabilities identified during the evaluation conducted in Requirement R4.

5.2. Law enforcement contact and coordination information.

5.3. A timeline for executing the physical security enhancements and modifications specified in the physical security plan.

5.4. Provisions to evaluate evolving physical threats, and their corresponding security measures, to the Transmission station(s), Transmission substation(s), or primary control center(s).

Reliability Standards for the Bulk Electric Systems of North America. nerc.com. Jan 2020.

DETECTION AND DETERRENCE AT THE PERIMETER

A security fence along the perimeter of an electrical facility is the first line of defense. But, by itself, it is only a minor deterrent to determined intruders – they can cut-through or climb it in seconds. Even without accessing any on-site buildings, intruders can threaten service, cause extensive damage, steal copper and other supplies, and/or fatally injure themselves.

Senstar offers a range of products that bring intelligence out to the perimeter. Intelligent lighting functions as an active deterrent while sensors and surveillance cameras detect and locate intrusion attempts. Perimeter detection enables a range of security responses, including triggering the site's alarm system, queuing up camera systems, and engaging deterrence devices like audio messages or additional lighting.

Interior areas can also be protected. As Senstar sensors share common communication protocols, a mix of sensors may be deployed at a site without adding additional infrastructure.

FUNCTION	PRODUCT	BENEFIT
DETER	Senstar LM100	Intelligent lighting and intrusion detection illuminates the perimeter. Can strobe at intrusion location.
	All Senstar sensors	Senstar intrusion detection sensors can trigger on-site deterrence devices like security lights or sirens
	Video analytics	Enable deterrence devices (lights, audio) via early pre-intrusion detection
	Senstar Symphony VMS	Software allows two-way audio support which enables voice down capability, so security personnel can speak to intruders
DETECT	FlexZone	Fence-mounted perimeter intrusion detection (cable)
	Senstar LM100	Perimeter intrusion detection (accelerometers in luminaires)
	FiberPatrol	Fence-mounted perimeter intrusion detection (fiber optic cable)
	Wireless Gate Sensor	Gate protection (accelerometer)
	UltraWave	Gate and area protection (microwave)
	Video analytics	Detect and track intruders and vehicles near, at, and inside the perimeter

Senstar LM100 Hybrid Perimeter Intrusion Detection and Intelligent Lighting System protecting an electrical storage yard.

ASSESS, COMMUNICATE AND RESPOND TO SECURITY THREATS

Senstar's video management software (VMS) and video analytic technologies complement perimeter sensors by providing assessment, communication, and response capabilities:

- Efficiently monitor hundreds of remote substations from a central location
- View surveillance video from all major camera manufacturers, including video from low-light and thermal devices
- Employ video analytics to enhance monitoring capabilities while reducing operator requirements
- Use sophisticated intelligent search for post-incident analysis

FUNCTION	PRODUCT	BENEFIT
ASSESS	All Senstar sensors	Zone or distance-based locating. Direct PTZ cameras to intrusion location.
	Senstar LM100	Uniform lighting along the perimeter enhances the assessment value of video cameras
	Senstar Symphony VMS	Camera callup, auto-PTZ and video analytic overlays
	Video analytics	Identify vehicles and people via license plate recognition and face recognition
COMMUNICATE	Senstar Symphony VMS	Streamline display of alarm, video, and location data
RESPOND	Senstar Symphony VMS	Provide response forces with key data, including mobile apps, and accurate location information

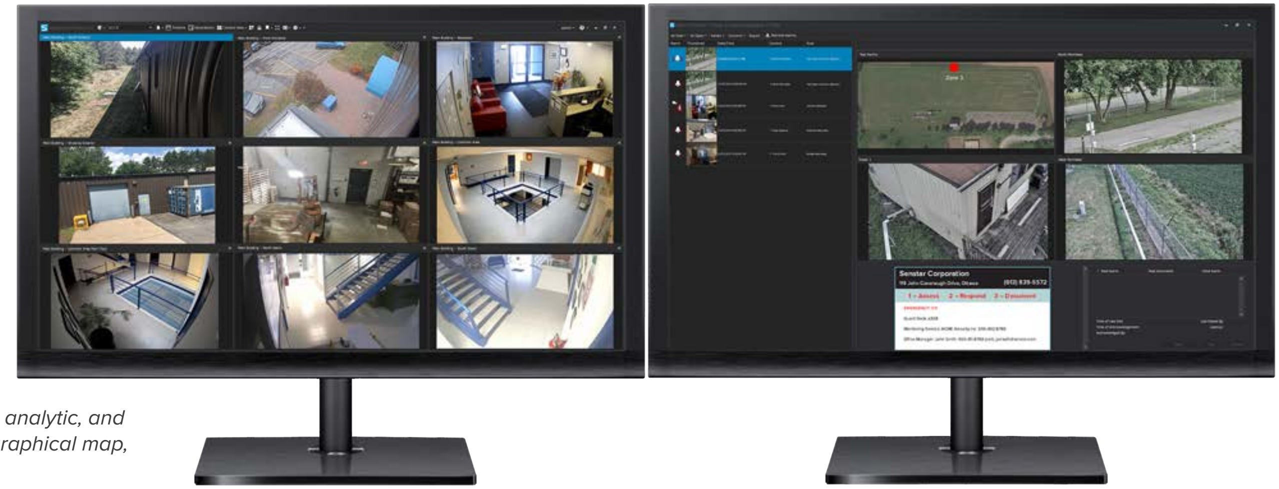
STREAMLINED VIDEO MANAGEMENT

The Senstar Symphony VMS enables operators to control their entire video surveillance system from a central location. Operator features include:

- Integrated sensor, video analytic and access control events
- On-site I/O device control, including 2-way intercoms
- Automated detection and tracking of vehicles and people

MOBILE SUPPORT FOR ON-CALL STAFF

Senstar Symphony can support on-call staff with a variety of functionality from their mobile device, including email/SMS alerts (with captured images), access to individual cameras, and on-device video recording.



Symphony's Alarm Console links sensor, video analytic, and access control events to multiple cameras, a graphical map, and event-specific instructions.

EQUIPMENT AND SOFTWARE DESIGNED FOR ELECTRICAL UTILITIES

In addition to effective assessment and response tools, energy utilities require scalable solutions that are suitable for deployment across large numbers of sites, are ultra-reliable, maintain a low nuisance alarm rate, and incorporate robust architectures that avoid downtime and unscheduled maintenance visits.

MADE FOR HARSH CONDITIONS

Senstar sensors are designed for use in harsh environments. The outdoor equipment is designed to operate across a wide temperature range (typically –40 to 70 °C / –40 to 158 °F) and includes advanced algorithms that minimize nuisance alarms generated by wind, rain, and snow.

ON-SITE FAULT TOLERANCE

Senstar sensors include support for bi-directional loop networks, redundant processors, power supplies and network connections, so that a failure of one component or sensor does not bring down the entire system.

REMOTE MANAGEMENT AND LOCAL FALLBACK

Site sensors can be managed by the Senstar Rugged Controller, designed for use at unmanned sites. It offers remote management, WAN/SCADA support, and local fallback capabilities to simplify administration and to provide local fallback if network connectivity is lost.

NO-MAINTENANCE VIDEO APPLIANCE

Senstar's Thin Client provides a simple, low-cost way to display live and recorded video, as well as export video to common formats for post-incident analysis. The compact Linux appliance requires no maintenance or regular software updates, making it an easy way to bring surveillance video to those who need it.

SCALABLE, MULTI-SITE VIDEO MANAGEMENT SOFTWARE

The Senstar Symphony VMS uses a scalable architecture that offers a feature set ideal for critical infrastructure operators:

- Edge storage – Video may be stored on-camera or edge devices to prevent the loss of critical video if network connectivity is disrupted.
- Licensing – Per-camera licensing makes Symphony ideal for gradual rollouts, as additional cameras can be added as required. Video analytic licenses are moveable – existing licenses can be repurposed to meet changing security demands.
- Built-in failover – Symphony includes support for redundancy and failover without the use of expensive Microsoft Clustering.

CLOUD-BASED DEVICE MANAGEMENT

The Senstar Enterprise Manager enables system administrators to centrally manage large numbers of video cameras and other security equipment. From a web-based interface, administrators can:

- Monitor the health of the video surveillance system
- Automate software and firmware updates
- Quickly identity offline cameras

CIP-014-2 PHYSICAL SECURITY SAMPLE PLAN

Site	Remote Transmission Substation
Physical threats	Copper theft, vandalism, sabotage and trespassing
Operational threats	Unauthorized access to outdoor equipment Unauthorized access to buildings and indoor systems
General deterrence practices	• Security lighting • Perimeter signage and warnings • 2-way intercoms at entrances • Automated PA system • Overt video surveillance

TACTIC	DETERRENCE	DETECTION	DELAY	ASSESSMENT	COMMUNICATION	RESPONSE
Cut, climb or lift fence fabric	Security fence or wall with outrigging Perimeter lighting PA system	Fence sensor Outdoor people tracking analytic	High quality and maintained security fence or wall	Surveillance system Security lighting 2-way intercom	Automated electronic notifications Email SMS Mobile app) Site security events linked to specific procedures and contact information	Local security forces
Climb gate	Security gate with outrigging Perimeter lighting PA system	Fence or gate sensor Outdoor people tracking analytic	High quality and maintained security gate			
Break or bypass gate lock	Security hardware 2-way intercom Surveillance system	Fence or gate sensor Latch contact Outdoor people tracking analytic	Security hardware			
Tunnel under fence or gate	Below-ground fence structure Hardened surface (e.g. concrete) Surveillance system	Fence sensor Outdoor people tracking analytic	High quality and maintained security fence Hardened surface (e.g. concrete)			
Firearms and explosive devices	Ballistic fencing/walls	Outdoor people tracking analytic Audio sensors				
Ladder-assisted climb	Security fence with outrigging Perimeter lighting PA system	Fence or gate sensor Outdoor people tracking analytic	High quality and maintained security gate			
Vehicle ramming	Security fence or wall	Fence or gate sensor Outdoor vehicle tracking analytic	Security fence or wall			
Elevated position perimeter crossing	Security fence or wall with outrigging	Outdoor people tracking analytic	Security fence or wall with outrigging			
Access via false or misappropriated credentials	Access control system Surveillance system	Schedule-based access License plate and/or face recognition analytics				

1 DETECT INTRUDERS AT THE PERIMETER

Outdoor People and Vehicle Tracking Analytic

Ideal for sites with comprehensive surveillance infrastructure

Senstar LM100

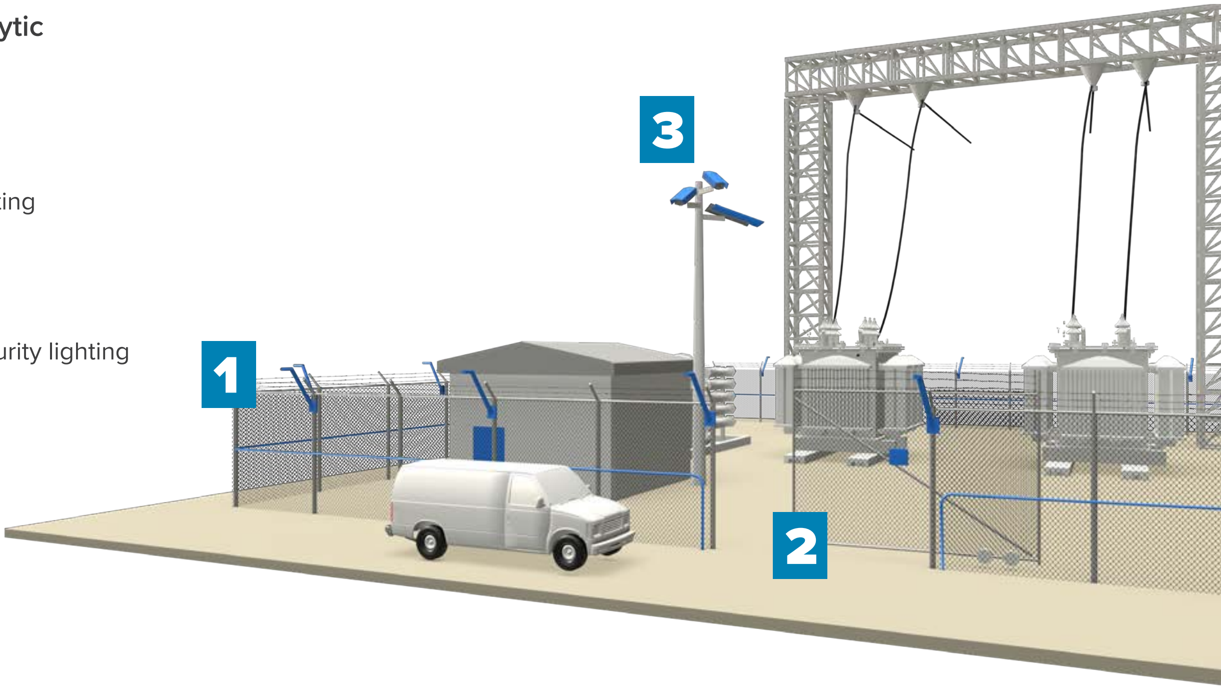
Ideal for new sites or those requiring security lighting

FiberPatrol

Fiber optic sensor, ideal for sites with existing security lighting

FlexZone

Ideal for sites with existing security lighting



2 MONITOR GATES AND OPEN AREAS

Sliding Gates

Monitor gate activity with Wireless Gate Sensor

Swinging Gates

Attach FlexZone, FiberPatrol, or Senstar LM100 directly to gate panels

Open Areas

Monitor open areas with UltraWave microwaves

3 TRANSFORM PASSIVE SURVEILLANCE INTO AN ACTIVE RESPONSE

Symphony supports cameras from all major manufacturers, including low-light and thermal models:

- Fixed cameras – Use outdoor video analytics to detect intruders outside and inside the fenceline
- PTZ cameras – Apply PTZ tracking analytics for hands-free camera control
- Intercoms – Use 2-way audio to deter intruders
- Device control – Trigger local deterent mechanisms, including security lights and pre-recorded messages
- Alert on-call staff – Provide on-call security staff with access to alarms, photos and video feeds, and mobile recording
- Identify people and vehicles using license and face recognition analytics

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