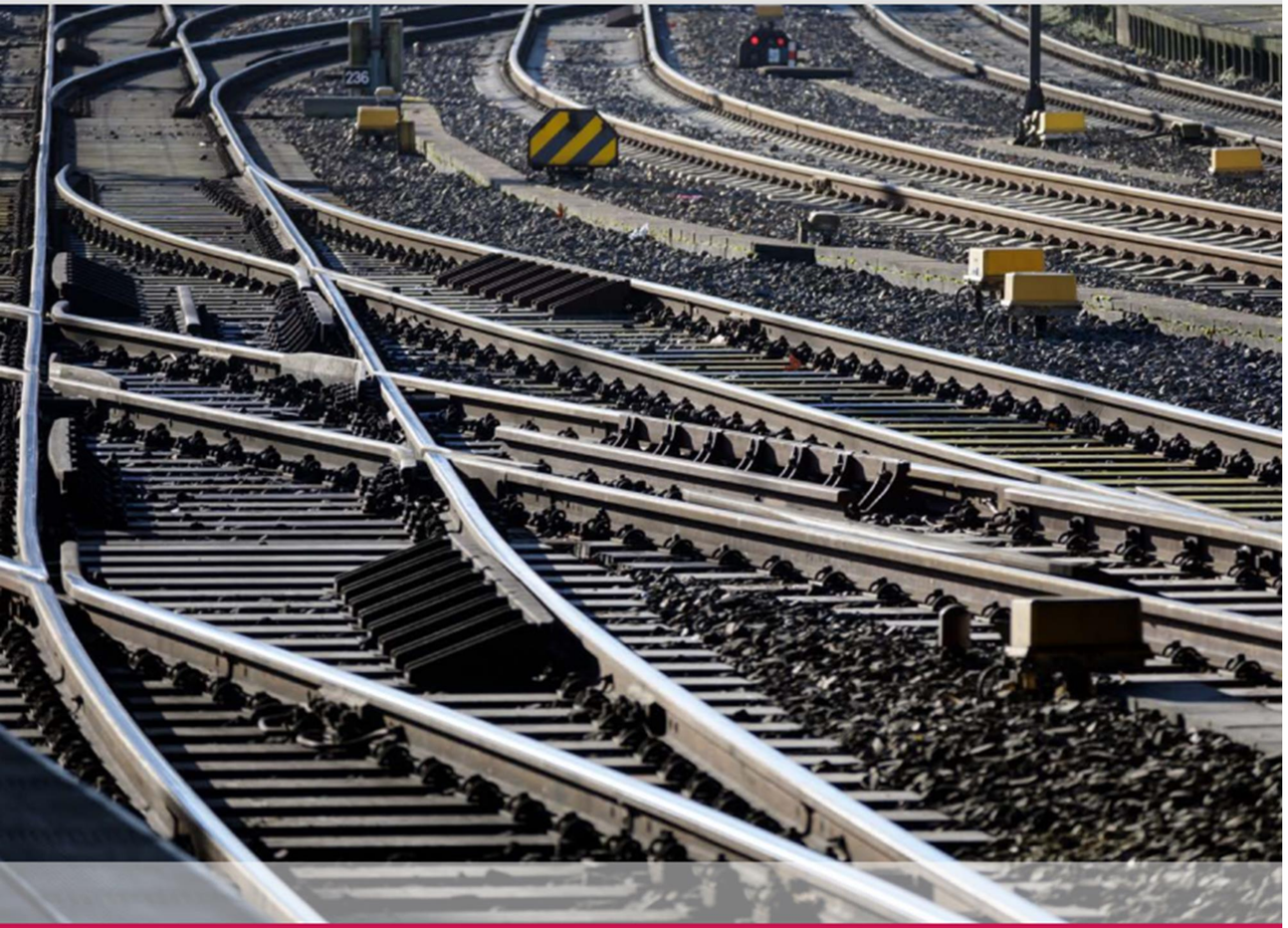


UIC LARA SECURITY TASKFORCE

19 March 2025

Online

Paula Fernández Díaz
Consultora de Seguridad Junior, UIC (Francia)

Definiendo el Robo de Metal y sus Motivaciones

1. Precios fluctuantes de los metales
2. Cobre = 8.825 euros/tonelada en 2024
3. Complejidad cadena de suministro
4. Desafío social y de seguridad

Fig. 1 – Tasas de cobre (por tonelada) en el mercado de materias primas (fuente: Markets Insider)

Impacto Directo en Operaciones Ferroviarias

Causas

- Percepción de bajo riesgo
- Dificultad para rastrear metales robados
- Abundancia de metales

Impacto

- Interrupciones operativas
- Pérdidas financieras
- Riesgos de seguridad
- Daño a la reputación

Evaluación de Riesgos

Partes interesadas

- Operadores ferroviarios
- Gestores de infraestructura
- Fuerzas del orden
- Comerciantes de chitarra
- Agencias gubernamentales

Tipos de delincuentes

- Oportunistas
- Grupos de crimen organizado

Clasificación de incidentes

- Robo de cables
- Robo de componentes de infraestructura
- Robo en instalaciones

Evaluación post-incidente

- Objetivos
- Ubicaciones
- Tiempos
- Gravedad (pérdidas de equipos y retrasos)

Base de datos de incidentes

- Facilita registro y seguimiento
- Permite análisis de ocurrencias
- Ayuda a identificar tendencias y vulnerabilidades

Respuesta al problema

Detección Avanzada: Vigilancia Inteligente

- Sistemas de videovigilancia avanzados (CCTV, Drones y Sensores de Intrusión)
- Patrullaje

Protección Reforzada: Fortificación de la Infraestructura

- Barreras físicas
- Sistema de marcado
- Señalización antirrobo
- Cableado subterráneo
- Dispositivos antirrobo

Mitigación Estratégica: Enfoque Colaborativo

- Reemplazo de componentes
- Memorándums de entendimiento

Detección Avanzada: Vigilancia Inteligente

RAIL SECURITYHUB

Search

ACCOUNT MENU

Home - Security Solutions - *THERMOGRAPHIC CAMERA*

Back >

THERMOGRAPHIC CAMERA

Infrared camera, Thermal imaging camera, Thermographic Screening, observational infrared camera, Thermovision, IR, Covid-19, anti-terrorism, Infrared light system (ILS), intrusion detection, video analytics, stations, tunnels, CCTV

★★★★☆ **4/5** *(1 vote)*

Add to Bookmarks

Threat : THEFT/FRAUD | METAL THEFT | INTRUSION, VANDALISM AND SABOTAGE | GRAFFITI | VANDALISM

Solution type : PHYSICAL AND TECHNOLOGICAL | DETECTION, SENSORS AND ALARMS

Application scope : DETECTION

Publication : 15/06/2020 - Last updated: 17/11/2023

Quick Access

DESCRIPTION

Thermal imaging cameras are tools that allow their users to see what their eyes cannot see. The technology is based on emitted heat radiation by all objects and human bodies regardless of lighting conditions.

A wide range of commercial and industrial thermal imaging cameras are available on the market for various applications, with which the user can see in complete darkness and through dark places such as smoke, haze, and fog with little or no light.

The devices recognize temperature differences between objects and people and illustrate them on a display. These devices produce high-resolution images that aid in identifying threatening situations efficiently. Furthermore, such devices can pinpoint and precisely determine moving objects and people's directions and movements.

The advantage of this solution is that criminals cannot hide their body temperature. Thanks to images produced by infrared devices, even in poor lighting conditions, security forces, police, or authorities can quickly intervene.

An immediate outcome of a thermal imaging device's use is the protection of employees and resources.

Examples of use

- Thermographic cameras are used to prevent and detect graffiti offenders, metal theft, general theft, and property damage. For example, certain applications of these tools include the following: monitoring ticket machines to detect people entering marshalling yards and parking lots (e.g., for painting graffiti or stealing goods from freight wagons); detecting people who are at or too close to the tracks at night (e.g., for metal theft); and detecting intruders in tunnels.
- In the safety sector, thermal imaging cameras are part of complex fire alarm systems in different types of buildings, stations, and tunnels.
- In epidemic and pandemic situations, such as in the case of COVID-19, thermal imaging systems can be considered reliable support mechanisms and preventive measures.
- Cameras can also be used in larger, coherent systems and in combination with other systems. This includes the *Infrored light system* (ILS) used by Deutsche Bahn AG (see documents below). The ILS detects human movements with the help of infrared light and, in some cases, additional thermal sensors. A predefined location (for example, the soc) is alerted if triggered in the detection area. Dedicated encoders

railsecurityhub.org X

RAIL SECURITYHUB

Search

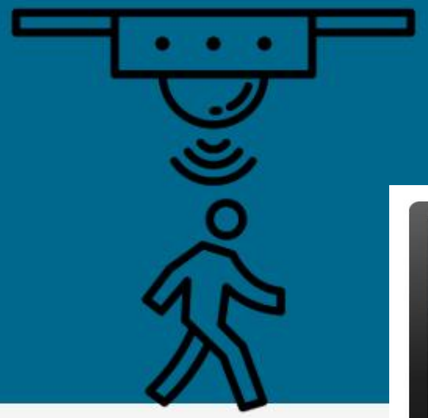
Back >

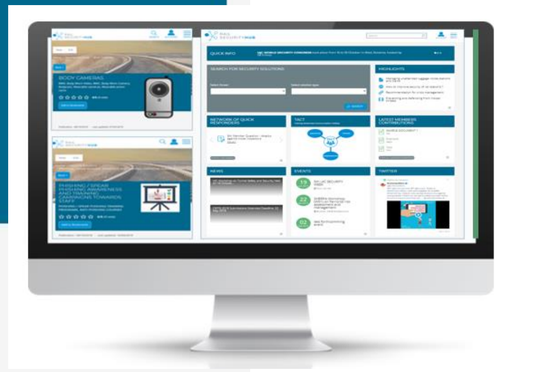
INTRUSION DETECTION SENSORS (VIBRATION, PASSIVE INFRARED)

TERRORISM AND EMERGING THREATS, STATIONS, TRAINS, STAFF AWARENESS, PUBLIC AWARENESS, INTRUSION DETECTION

★★★★★ **5/5** *(1 vote)*

Add to Bookmarks





railsecurityhub.org x

Publication : 04/10/2023 - Last updated: 05/07/2024

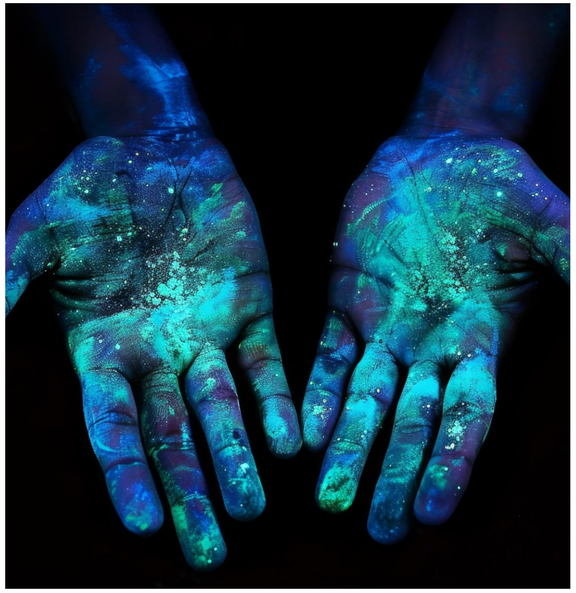
DESCRIPTION

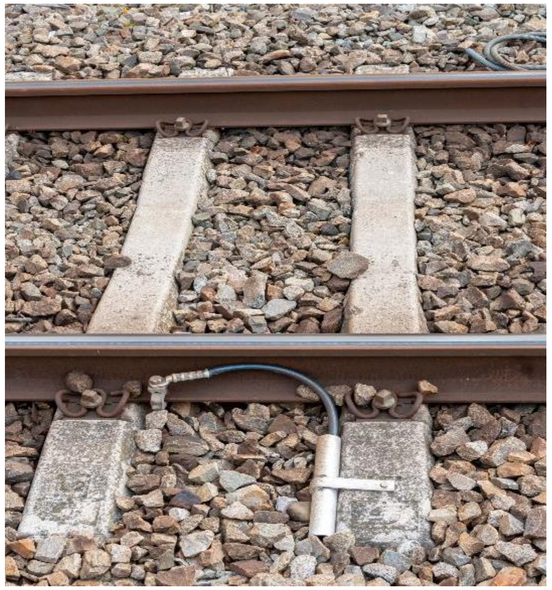
The railway sector needs increased protection for passengers, rolling stock and infrastructure. Therefore, detection systems are becoming increasingly sophisticated and comprehensive. They are used mostly to enhance security and safety across the whole railway network. For example, intrusion detection systems monitor and protect railway tunnels, level crossings, or properties from theft (e.g. equipment, assets, metals) or vandalism (e.g. ground sensors detect the acoustic emissions associated with human footsteps on concrete surfaces).

Gound Sensor Detection systems for protection may consist of:

- Alarm-raising components – which monitor possible perpetrator entry, access, and exits so that the accesses can be tracked via

Protección Reforzada: Fortificación de la Infraestructura





RAIL SECURITYHUB

railsecurityhub.org

View | Edit | Delete | Voting results | Revisions

Home - Security Solutions - *CABLE MARKING SYSTEMS*

Back >

CABLE MARKING SYSTEMS

CABLE MARKING, CABLE DNA, METAL THEFT

☆ ☆ ☆ ☆ ☆ **0/5** *(0 vote)*

Add to Bookmarks

Publication : 15/01/2025 - Last updated: 29/01/2025

DESCRIPTION

Mitigación Estratégica: Enfoque Colaborativo

Conclusión

Soluciones:

- Abordaje individual por empresas ferroviarias = alcance limitado
- Colaboración sectorial amplia
- Papel clave de organizaciones como UIC
- Vínculos con otras industrias afectadas (construcción, telecomunicaciones)

Tecnologías Emergentes:

- Cámaras con IA en trenes
- Drones automatizados para patrullaje
- Inteligencia de Código Abierto (OSINT)

Desafíos de Implementación:

- Costos de desarrollo e integración
- Cumplimiento de leyes de privacidad
- Consideraciones éticas (IA y tecnologías autónomas)

UIC WEBSITE (SECURITY ACTIVITY):

uic.org/security

SECURITY PRIVATE WORKSPACE:

extranet.uic.org

Around 1000 documents available.

railsecurityhub.org

Recursos Disponibles en la Plataforma de Seguridad UIC

Disponible en https://uic.org/security

Futuros pasos UIC LARA Taskforce

Thank you!

Stay in touch with the UIC Security Department

security@uic.org

uic.org/security

Marie-Hélène Bonneau

Grigore Havarneanu

Laura Petersen

Bruno De Rosa

Paula Fernandez Díaz

INTERNATIONAL UNION
OF RAILWAYS

Thank you
for your attention

https://uic.org/latin-america/

Stay in touch with UIC: #UICrail