TOSYALI
HOLDİNG

HARSCO

Tosyalı Harsco Crane Operation Monitoring
delivered by Argeloji

METAL PROCESSING, RECYCLING

Obtaining full visibility and transparency of the material flow within their facility now allows Harsco for a continuous improvement of their processes, which has so far led to an impressive 15% increase of production efficiency.

15%

material flow improvement
of site operations

Turkish Steel Iron Leader

Tosyalı Holding established a strategic cooperation with a technology partner Harsco Environmental for the sake of **creating a cleaner and more efficient metal production**. This joint venture's main focus is on metal recovery services and slag sales in the facilities of Tosçelik located in Osmaniye, Turkey.

In their facility **they bring 1.2 million tons of slag waste back to the economy every year** by using it as a raw material both for metal recovery and road construction, cement production, fertilizer production and other similar use cases.

A view of the scrap yard in Osmaniye.

Goals

Increasing Production Efficiency and Improving Employee Safety

At Tosyalı Harsco, the scrapyard spreads over **18 000 m2 with piles of scrap and slug** all around the facility. **6 overhead cranes** are then used to collect these and transport them from the scrapyard to the production for melting. On top of that there are also **2 ground vehicles** operating in two different zones of the facility and also employees who oversee these processes and operate the machines on the ground.

A view of the melting process.

The first phase and core aim of this project was to track not only the real-time position of 6 overhead cranes, which are used to transport scrap around the scrapyard but also their activities - **detecting the times when and places where the crane is loaded/unloaded**, to **increase the efficiency** of the company's production processes.

A view into the indoor facility of the Tosyalı Harsco Scrap Yard.

The focus of the second phase of this project was to **improve the safety of operators within the facility** by detecting dangerous situations where there is a close proximity between cranes and ground vehicles, which could potentially result in serious injuries and material damage.

Harsh Metallic Environment and Challenging Data Processing

The **scrapyard hall is literally packed with metal** – from metallic parts to constructions, machines and overhead cranes that all contribute to the **signal bouncing and blocking**, making it harder to find a reliable and accurate technology for indoor positioning. Additionally, the fact that the facility is extremely dusty, presents additional strain to the RTLS hardware and its lifespan.

Harsh metallic environment with overhead cranes in the scrapyard hall.

Secondly, it was necessary **to establish communication between the RTLS**, which determines the location of each crane **and the On-Edge Processors** which determine the particular activity of each crane.

Our technological partner Argeloji also had to take on the challenge of customizing the BlueOperation On-Edge Processors which are directly connected with the open/closed switches of the crane to be able to match the activity of the crane with its position.

Detail of the open/closed switch of the crane.

Direct Five Anchors Harsh metallic environment.

Another challenge was to **ensure flawless cooperation and communication between three different softwares** – Sewio RTLS, BlueOperation On-Edge Processors and Harsco Scrapmaster production management software.

![Sewio logo]

Sewio RTLS produces 18 data logs about the positions of the different cranes every second, which need to be matched with data from the BlueOperation On-Edge Processors to determine the activity of each crane in that exact moment and all this data then needs to be crunched by the Harsco production management software, where operators need to be able to see it in real time.

Real-Time Positioning Recording the Activity of Each Crane

In order **to cover the entire 18 000 m2** of the scrap yard with Sewio RTLS, considering the harshness of the environment in the facility, Argeloji had to install **83 anchors**. All six overhead cranes had been equipped with Sewio UWB tags and two additional tags had been mounted on the ground vehicles to track their movement.

Additionally, **BlueOperation On-Edge Processors** have been deployed on each crane in order to detect their activities and communicate those to the RTLS Studio.

Tracking of movement of the overhead crane in operation.

As for the safety use case, **two virtual, so-called "dangerous zones" were created** in those parts of the facility where the two ground vehicles operate and where dangerous situations could possibly arise. The RTLS system is able to recognize when a crane enters one of these zones and ground vehicles and their **operators are warned by signaling devices to ensure their safety**.

Ground vehicle operating both on the outside grounds and inside facility of the scrapyard.

Last but not least, Sewio RTLS was fully integrated with BlueOperation On-Edge Processors and also the Harsco production management software, ensuring the **smooth exchange of data** needed **to provide the operators with real-time and reliable data**.

"Harsco's main goal was to track overhead cranes movement and we knew how harsh the environment we work was. Sewio RTLS has demonstrated remarkable performance and reliability together with BlueOperation. We got positively surprised then finding out the wide range of applications cases Sewio RTLS has. After the cranes tracking, we implemented the anti-collision system and a couple of new features are in the pipeline for the next future."

Paolo Ceretti
Engineering IT Analyst at Harsco

Solution Numbers:

18,000 m²
area covered

83
receivers (=anchors)

8
tracked objects (=tags)

7
On-Edge Smart processors

Results

Boost in Production Efficiency and Improved Employee Safety

Our partner Argeloji did a tremendous job in the implementation part of this project and managed to get the RTLS up and running within 2 months, which given the harshness and complexity of the environment is a truly admirable speed. Thanks to the **fast implementation and launch of the system**, the new platform has been delivering a **positive ROI since shortly after purchase**.

However, most importantly, **obtaining full visibility and transparency of the material flow** within the facility **now allows for a continuous improvement of the processes**, which led to an impressive **15% increase of production efficiency**.

Inside area of the scrapyard with the overhead crane in operation.

![Sewio logo]

On top of that, being able to detect the real-time positions of both cranes and ground vehicles allows us to **evaluate dangerous proximities** between the two entities and **prevent accidents** from happening thanks to alerting the operators. This led to a tremendous **20% decrease in the number of occurred on-site accidents** and thus helped to significantly increase employee safety.

Inside the scrapyard, the ground vehicle in operation.

"When this project started, we had to select the technology to adopt and the partner to rely on. Sewio RTLS and BlueOperation On-Edge Processing mechanism combination were one on the options, but thanks to the assistance we have had from Argeloji since the first contact, they have become our preferred choice. Argeloji supported very effectively Harsco during all the implementation steps by contributing with new ideas as well."

Paolo Ceretti
Engineering IT Analyst at Harsco

Results:

100%
increment in crane
safety awareness

15%
increase in production
efficiency

2 months
implementation time

Key Factors for Choosing Sewio RTLS

- Unlike RFID and Bluetooth or other automation alternatives, Sewio's UWB-based technology works with higher precision, flexibility and can work in **harsh metallic and variable environments**;

- The ability to **easily set an unlimited number of virtual zones** that can be updated with a single click at any time in the future to adapt to the updates of the company's processes;

- Proven successful IOT projects using methodology and technology, backed up by **unrivalled 10+ years of UWB expertise**;

- The ability to **scale the system easily and quickly**;

- The guaranteed **long battery life, even with the high refresh rate needed** for tracking movement;

- **Short time for deployment (2 months only)**.

ARGELOJI
organized know how

Argeloji offers the following services:

RTLS Based IoT Solutions
Workforce Management, Asset Tracking, Forklift Tracking, Patient and Employee Location Tracking, HSE Operations Support Systems.

Computerized Maintenance Management System
IoT Based Digital Maintenance Management system for facility and factory operations.

Mobile Apps Based IoT Solutions
Proximity Marketing & Information, Indoor Navigation & Wayfinding, Operational Excellence Manage, Interaction End User Management, Mobile Order & Payment, Mobile Banking, Mobile Public Transportation, Mobile Tourist Guiding Services.

Building Technologies Based IoT Solutions
Integrated Smart City Systems, CCTV Systems, Access Control Systems, Fire Alarm & PA Systems, People Tracking System, Data & Network & Comm. Systems, Energy Efficiency Solutions, Facility Management Systems.

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Sewio Networks, s.r.o.

Sewio Networks is a manufacturer of a **real-time location system (RTLS)** for indoor tracking that drives business results for companies in the intralogistics, retail, sport, entertainment and livestock industries. Sewio system is built on **ultra-wide band technology (UWB)** and delivered with RTLS Studio, remote management and visualization software.

It gives partners and customers a precise, easy-to-integrate, reliable and fully scalable IoT solution for indoor tracking that allows process visibility, boosts production efficiency, simplifies the inventory process and increases safety. Founded in 2014, Sewio is headquartered in the Czech Republic with offices in Germany and France. Sewio has 70+ system integration partners and powers customers in 37 countries. Customers include: Volkswagen, Budvar, Pirelli, Matador, TPCA, Škoda.

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