

October 28, 2021

Kawasaki Kisen Kaisha, Ltd.

“K” LINE and IBM Japan, Field Trial Utilizing IoT and AI Conducted to Improve Safety and Quality of Car Carrier Cargo Handling

Kawasaki Kisen Kaisha, Ltd. (“K” LINE) and IBM Japan, Ltd. (IBM Japan) have conducted a field trial with the objective of improving work quality by strengthening the safety management of cargo handling. Internet of Things (IoT) devices and artificial intelligence (AI) were utilized to collect and analyze information on driving of vehicles during operation in cargo holds, positional information of vehicles and workers, and vital information of workers.

The field trial verified the restriction of driving speed of vehicles, prevention of contact between vehicles and workers, prevention of collisions of vehicles, and collection of vital information of workers. Specifically, with the cooperation of a stevedoring company, beacons (positional information sensors), surveillance cameras, and speed measurement equipment were installed on the cargo deck to collect data. Furthermore, AI-based image recognition technology (Note\*) was used to separate vehicles and workers based on camera images to determine the status of their proximity. In addition, heart rates data were obtained from wearable devices (Note\*) and based on analyzed data by algorithm to ascertain trends in driver stress. The aim is to improve work quality by strengthening the safety management of cargo handling by analyzing this diverse and complex data and visualizing the number and condition of speed violations and near-miss incidents in the vessel.

IBM Cloud, which is secure and has a track record in many companies as a data platform, was used for data analysis. IBM Japan created IBM® Maximo Monito, a solution for remote monitoring, on IBM Cloud to provide real-time visualization of large data sets, AI-based anomaly detection, and a configurable dashboard. This solution enabled the collection, management, and analysis of sensor information, and data scientists played a central role in supporting tasks such as IoT application design and data analysis.

“K” LINE will conduct further verification aimed at practical implementation based on the results of this field trial.

“K” LINE aims to establish a world-leading safe operation system, with contribution to people living well and prosperously under its corporate philosophy as an integrated logistics group. In order to further strengthen safety management in the car carrier business, “K” LINE believes it is important to further utilize digital technologies such as IoT and AI.

“K” LINE has also been engaged in strengthening communication infrastructure. The “CENTURY HIGHWAY GREEN,” a next-generation environmentally friendly car carrier, was delivered to “K” LINE in March 2021, equipped with significantly improved facilities for communication within the vessel and between the vessel and land. By adopting a variety of environmental measures and digital technologies, “K” LINE will remain committed to the improvement of safety, the environment, and quality as a key issue it faces.

<Reference>

March 12, 2021 release:

Delivery of Next-generation Environmentally Friendly Car Carrier Fueled by LNG "CENTURY HIGHWAY GREEN"

<https://www.kline.co.jp/en/news/car/car753727087818379669/main/0/link/210312EN1.pdf>

<Images> (Note\*)

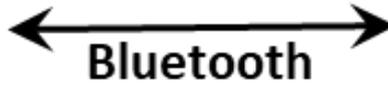
Monitoring by using AI-based Camera on the cargo deck.



Acquisition of biometric information obtained as heartbeats of stevedores using wearable devices. (Wearable IoT solution from [Mitsufuji](#).)



(Wearable IoT solution)



(Wireless Technology)



(Application Software)