

## **Abstract**

The invention relates to a system and method for **real-time monitoring and managing shipboard dangerous goods freight container** based on the technology of the internet of things in the field of maritime transport. The invention comprising the steps of measuring environment parameters using sets of plurality of detectors with a **wireless sensing node** in a dangerous goods freight containers; recording the real-time environment data onto a internal storage memory; programming **wireless coordinator station** distributed onboard the ship as WiFi access point for checking containers in range, listening, receiving sensing information of the wireless sensing systems, state information, cargo data, transmitting the sensing information to a **shipboard monitoring centre**; system to realize a server-client communication, interwork seamlessly, automated and integrated real-time monitor storing, and displaying the sensing information and data analysis, thus integrally accomplish onboard dangerous container monitoring process, real time follow, and providing an information service and a decision-making consulting service in the process of maritime transport of dangerous goods freight containers.

## **Background**

Freight Container transportation is characterized by high efficiency, convenience and has an important position and role in current logistics arrangements. In terms of value, global seaborne container trade is believed to account for approximately 60 percent of all world seaborne trade, which was valued at around 12 trillion U.S. dollars in 2017. Container-carrying capacity has increased by approximately 1,200% since 1968 and some of the world's biggest container ships are nearly about 400mtrs in length. The increased size has produced increased operating efficiency and improved international economy. Yet, there is little doubt that the real-time monitoring and managing dangerous goods in freight containers and support capabilities to mitigate containerized high-risk cargo-related incident at sea has progressed in proportion to increase in ship cargo carrying capacities. There have been several well-publicised ship-board explosion and fire incidents involving laden containers over the recent few years and as the size of container ships increases, so does the potential risk and consequence of maritime disasters.

As the name depicts, Dangerous Goods should be treated with the utmost significance. Since changes that are unfavourable to ensure safe carriage could occur during transportation, it is therefore important to pay more attention to the internal environment parameters of the container during sea passage. With the right knowledge and information, the on-duty personnel can make well-informed decisions when dealing with shipboard contingencies.

In many situations, to ensure unsafe conditions don't develop and be able to take appropriate corrective and preventive measures during shipboard contingencies it is important to detect the hazards such as gas leakages or elevated cargo temperatures or loss of container structural integrity that can pose risk to workforce, result in cargo damages or brings massive losses for the shipowners. Shipboard real-time monitoring system presses for a kind of technology to solves this difficult problem.