

TECH OFFER

Real-Time Monitoring Fall Protection System for Work-At-Height Safety



KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Smart Cities

Electronics - Sensors & Instrumentation

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **HONG KONG**

ID NUMBER: **TO175437**

OVERVIEW

In Singapore, where workplace safety is of paramount concern, the Ministry of Manpower (MOM) have always been actively monitoring with compliance and enforcement to meet their objective of less than one workplace fatality per 100,000 workers by 2028. Unfortunately, workplace deaths have been steadily increasing, with falling from height being the highest cause of incident within the construction industry in 2024 with inadequate Workplace Safety and Health (WSH) management, non-compliance and unsafe behaviour being common root causes. With potential loss of man-day and even life, companies are actively looking for solutions which ensure workers working-at-height are safe and compliant.

The technology owner has developed an innovative safety solution designed to enhance safety for workers operating at heights. It provides relevant stakeholders with real-time information about the usage of safety harnesses, as well as the precise or general positioning of the worker before, during and after work-at-height (WAH) activities. This capability enables effective monitoring of compliance of workers in high-risk areas and facilitates the implementation of follow-up training and safety improvements.

The technology solution has been successfully tested and deployed in various construction sites in Hong Kong. The owner is currently looking for industrial players, such as contractors, and facility management teams, who will find this solution valuable for reinforcing compliance and reducing WAH risk across various operations.

TECHNOLOGY FEATURES & SPECIFICATIONS

This comprehensive technology solution, comprising of devices attached on the fall protection equipment, various anchor base stations and location tags, helps monitor the compliance of WAH work before, during and after activities with additional functionalities benefiting companies, such as:

- Being able to retrofit into existing fall arrest system while ensuring full operation and compliance of such fall protection equipment
- Robust, compact and IP65 for daily rugged use (e.g. construction site)
- Digital cloud platform for monitoring real-time 3D positioning information of worker accurately
- Detects proper wearing of harness and anchoring of harness hook to anchorage point with alarms if non-compliance
- Built-in RFID scanners for identification of workers for effective remote monitoring
- Manual emergency rescue request by workers during WAH activities
- Generation of daily warning records and automatic reports for recordkeeping and follow-up action
- Possible addition of other IOT sensors for monitoring and integration to existing monitoring system
- Able to be scaled for large deployment sites

POTENTIAL APPLICATIONS

With this innovative safety solution designed to enhance safety for workers operating at heights, this enables WAH work to be conducted safely in various use-cases, such as:

- Construction Industry such as monitoring of workers on scaffolding, rooftops, elevated platforms, etc.
- Facility Management (FM) and maintenance such as building inspection, façade cleaning
- Oil & Gas Industry such as work on elevated platform and structures
- Other industrial WAH work requiring fall protection system for safety and compliance

MARKET TRENDS & OPPORTUNITIES

Within the Workplace Safety and Health Report 2024 by MOM Singapore, the workplace fatal injury rate has increased from 0.9 to 1.2 per 100,000 workers from 2023 to 2024 respectively. For workplace major injuries, “fall from height” is highlighted to be the 3rd most common incident causes. Specific to the Construction Industry, “fall from height” is the most common cause for fatal and major injuries in 2024 with 44 incidents.

From January to June 2024, more than 1,000 inspections were conducted by MOM, resulting in a total of 9 stop-works orders and fines totalling \$452,600 given by MOM to companies flouting rules that protect workers carrying out work at high places.

UNIQUE VALUE PROPOSITION

This technology solution enhances the safety and compliance of any WAH work through a smart safety harness system with the ability to retrofit into existing fall arrest system while ensuring full operation, compliance and certification of such system. The

compact, IP65-rated form factor makes it ideal for rugged environments while ensuring continuous monitoring of proper anchorage, improper harness use and emergency distress signals. The solution can be integrated with RFID-enabled individual identification for tracking and recordkeeping. With automated report generation, seamless IOT sensor integration, it enables scalability while maintaining performance in eliminating fall from height fatalities at workplace.