Development of an Enhanced Risk Management System for Construction Defect Control in Industrial Plants

Kihun Song[1]*

[1] *Sung Kyun Kwan University / Hyundai Engineering & Construction, Republic of Korea,* E-mail address: kihun.song@hdec.co.kr, khsong41@gmail.com

Abstract:

This paper proposes the development of an advanced Risk Management System (RMS) using Risk-Based Methodologies (RBM) specifically tailored for addressing construction defects in industrial plants. Urbanization and industrialization demand robust frameworks to handle the complexities and safety concerns in construction projects. Traditional risk management often overlooks critical aspects such as persistent construction defects. This paper discusses the development of an innovative Risk Management System (RMS) that integrates Risk-Based Methodologies (RBM) specifically for construction defect mitigation in industrial settings.

The study centers around the implementation of Risk-Based Inspection (RBI) techniques, tailored to enhance traditional risk management systems. This includes developing a specialized risk assessment tool alongside an online management platform, designed to provide continuous monitoring and comprehensive management of construction risks. The proposed system—RBE-i (Risk-Based Execution for Installation)—focuses on identifying, evaluating, and mitigating risks effectively, utilizing a systematic approach that integrates seamlessly into existing construction workflows.

The RBE-i system's core lies in its ability to conduct thorough risk analyses and real-time data provision. It uses digital technologies to improve communication, operational efficiency, and decision-making processes across construction projects. By applying these methodologies, the system enhances safety and ensures more efficient project execution by preemptively identifying potential risks and addressing them promptly.

Field applications of RBE-i have demonstrated its effectiveness in significantly reducing construction defects, thus validating its potential as a transformative tool in construction risk management. The system sets new industry standards by shifting from reactive to proactive risk management practices, ultimately leading to safer, more reliable, and cost-effective construction operations.

In conclusion, the RMS developed through this study not only addresses the pressing needs of construction risk management but also proposes a paradigm shift towards more proactive, structured, and technology-driven practices. The successful integration of the RBE-i system across various pilot projects illustrates its significant potential to improve overall project outcomes, making it an invaluable addition to the field of construction management.

Key words: Risk Management, Risk-Based Inspection, Construction Defects, Industrial Plants, Proactive Mitigation