Constructional Health Monitoring and Maintenance Strategies for Aging Industrial Infrastructure

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Abstract: *The aging of industrial infrastructure poses significant challenges to safety, reliability, and operational efficiency. To address these challenges, effective structural health monitoring (SHM) techniques and maintenance strategies are essential. This paper provides a comprehensive review of current SHM methods and maintenance approaches tailored for aging industrial infrastructure. It explores advanced sensor technologies, hybrid SHM techniques, digital twins, and augmented reality integration, alongside autonomous maintenance systems. Additionally, it discusses the importance of standardization, sustainability, and environmental considerations in promoting widespread adoption. Through synthesizing existing research and providing future recommendations, this paper aims to advance SHM and maintenance practices for aging industrial infrastructure*

Keywords: Structural Health Monitoring, Maintenance Strategies, Aging Infrastructure, Sensor Technologies, Digital Twins, Autonomous Maintenance, Sustainability