Establishment of steel bridge resuscitative engineering to recover and improve the function of steel bridges with serious fatigue damage

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【Outline of survey】

Recently many cases of fatigue damage were observed in many steel bridge girders and piers of Metropolitan Expressway, Tohmei Expressway, Tohkaido-Shinkansen, which have been suffering severe and heavy traffic loads. Some of cases were serious condition with long fatigue cracks. This study aims to establish the resuscitative technology including inspection, diagnosis, design of retrofitting and monitoring. This technology can be realized by integration of leading-edge research and most-advanced technologies, for example micro-material test by small sample, high-accuracy ultrasonic flaw detection system, micro-fabrication technology. Then applicability of these methods will be verified by experiment with real-scale models. Moreover, the development of engineer education platform and self-diagnosis monitoring system is also target of this study.

【Expected results】

The resuscitation technology will be established by integrating the hard and soft of the leading-edge research and most-advanced technologies. In addition, the engineer education platform will be realized by building up the database, which can provide accurate information for engineers when it was needed, and the consultation system with visualization technology, which can show the huge amount of related information for the engineers, by using the case study database and large scale numerical simulation. The monitoring system with self check will be developed. Finally, these result well be published as text book for the specialists in this field.

【References by the principal researcher】

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• Narongsak Rattanasuwannachart, Kazuya Takahashi, Chitoshi Miki and Sohichi Hirose:Development of 3D Flaw Detection System with Multi-Channel Planar Array Probes and 3D Saft Algorithms, Structural Eng./Earthquake Eng., Vol.22, No.1, pp.27s-39s, 2005.4

【Term of project】 FY2006－2010	【Budget allocation】20,000,000 yen

【Homepage address】 http://www.cv.titech.ac.jp/~miki-lab/