

SOLVING PRACTICAL ENGINEERING PROBLEMS OF STRUCTURAL STRENGTH-APPLICATION OF DYNAMIC REANALYSIS METHOD AND MODEL TESTING

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Abstract

There are numerous examples of failure of responsible parts of steel structures. When failure occurs, series of procedures are performed in order to obtain the cause of failure and to repair the damage. However, prevention of failure should be given higher importance. That means that one can predict reaction of construction in any unexpected circumstances, having overall knowledge about construction. Actually, dynamic reanalysis method and model testing could give comprehensive insight into structural behavior of construction. Dynamic reanalysis method implies that the stress is not the only indicator of weak points in structural design. One should know modal shapes and natural frequencies, and distribution of potential and kinetic energy in the main modes. In fact, the main mode shapes show how the structure behaves under some possible load. Reanalysis method is based on distribution (of difference) of kinetic and potential energy and involves the transformation of the existing models in the new (better) one. Model testing represents one of the solutions to obtain the whole picture of construction behavior and includes creation of sub-scaled model in order to anticipate the behavior of the real construction, regarding the behavior of the model. Model testing enables to predict the stresses and deformations, and dynamic behaviour of the real structure regarding the stresses and deformations of the model, and testing on the model instead of the actual construction results in a great saving of money and time. Once again, dynamic reanalysis method and model testing give overall knowledge about construction.

Keywords: *distribution of kinetic and potential energy, finite element method, reanalysis method, model testing, sub-scaled model:*