

ANALYTICAL STUDY ON SEISMIC RESPONSE OF PIPING UNDER MULTIPLE SUPPORT EXCITATIONS

Conventional response spectrum analysis is used for piping seismic design in Japan. When piping is supported by restraints and structures fixed on multiple buildings or floors, the envelope of the response spectra of all supporting points is typically applied for the piping under multiple excitations. The local vibration mode of long piping is difficult to excite by the far input from the vibrating part, so the analysis will overestimate the response. Considering each input from each building or floor can estimate more reasonable seismic response of the piping. The researches about seismic response analysis by multiple input excitations have been performed since 1960s and the analysis methods are used for piping design in the United State.

There are a few experimental researches to verify the validity of the analysis method by multiple excitations. So an excitation test by multiple excitations planned to verify the validity of the application. This current study was performed as a preliminary investigation for the excitation test and it was to obtain the seismic response of a piping model by multiple excitations. Several kinds of analysis methods are compared and the characteristics of them are discussed.

東日本大震災以降、原子力発電プラントに要求される地震条件は更に厳しくなり、機器・配管系の構造成立性は困難になりつつある。配管系の耐震評価をより現実的なものとし、構造成立性を向上させる一つの手法として、多入力地震応答解析法の適用が挙げられる。配管系モデルに対して複数種類の多入力地震応答解析を実施し、その特徴や適用性について検討を行った。

甲斐聡流	原子力セクター設計グループ
大谷章仁	原子力セクター設計グループ
金子尚昭	原子力セクター設計グループ