

Effect of soil-structure interaction on the seismic behaviour of pedestal-structure system in large dish antennas

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ABSTRACT

Regarding the progressive improvement in the territory of Space Technology in all developed countries and consequently developing countries including Islamic Republic of Iran, the optimization of design and utilization of the communication equipment has been paid more attention today. For instance, considering recent highly innovative methods, specifically in communication field, developed for design, manufacturing and exploiting dish antenna for specific cases, cooperation of other science and technology experts, like civil engineers, is also necessary. In this way, more delicate design procedure in order to satisfy communication requirement, is achieved. So far, no specific investigation about aforementioned subject, especially the effect of soil-structure interaction (SSI) in analysing the seismic behaviour of communication large dish antennas has been conducted in Iran. In this paper, with the aim of investigating the effect of SSI on seismic behavior of pedestal, first an acceptable range for antenna displacement – as the most important parameter in pedestal structure for antenna – in both operational and survival states, has been calculated numerically based on generic formula. Secondly, the modelling of the whole pedestal-structure system has been modelled subjected to the associated loads and other primary conditions. This procedure has been performed once without considering the SSI and once more with it. Comparison of the obtained results shows that considering the SSI would impress the output results with a difference rate more than 50% and 600% respectively at survival and operational condition.

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