THE STUDY OF THE NATURAL VIBRATION MODES OF A COKING CHAMBER IN TWO MODELLING CASES

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In this paper, the authors determined the first 10 natural vibration modes for an analyzed coking chamber, three-dimensional modelled, for the purpose of making a comparison between these frequencies` values and the frequencies` values obtained in the case of that coking chamber modelled as a cantilever beam (according to STAS 9315/1-80). They used the computer program COSMOS 2007 in order to determine the dynamic behaviour of the given structure to the seismic action.

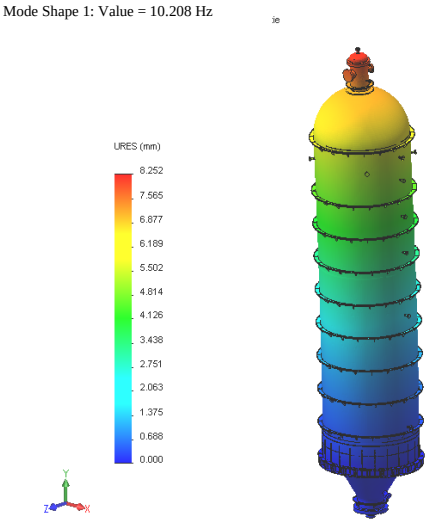

Figure 1

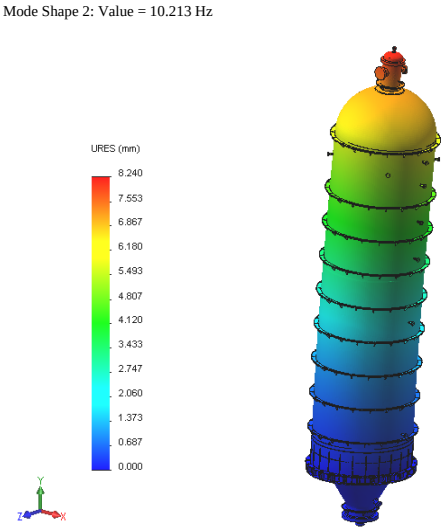

Figure 2

The first two frequencies having quasi-equal values ($f_1 = 10{,}208 Hz$ and $f_2 = 10{,}213 Hz$) correspond to a coking chamber's vibration as a cantilever column along the Ox and Oz directions, similar to the first vibration mode of a cantilever beam.

The following two natural frequencies have also close values (($f_3 = 15{,}093$ and $f_4 = 15{,}239 Hz$) and correspond to the local vibrations of the column's shell.

After the comparative study, the authors concluded that the ground's movement has no influence on the dynamic behaviour of the column modelled as a shell, but it has influence when the column is modelled as a beam.

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