



ABSTRACTS

4. Alexandra Nadia DABIJA (married CÎRDEI), Dumitru ONOSE: Prediction of the behavior of a bridge using the deformation model

Deformation analysis, especially for constructions of particular importance, is an up to date theme. Improving the process of determining them and reducing the time needed to analyze the results are the main concerns of researchers in the field.

The present paper aims to highlight the steps necessary to achieve the prediction of the behavior of a bridge located on the A2 Highway over the Danube-Black Sea Canal, based on the measurements made for the deformations determination. It also aims to demonstrate the usefulness of implementing deformation analysis results in risk management.

Based on the measurements made in several phases, the deformation model is made using the finite element method. Information about the structure of the bridge and the forces acting on the structure, is later added to this deformation model. The model is tested and adjusted until it is stabilized, in other words the results provided by the model need to check out with measurements from the next phase.

After stabilizing the model, it can be used for various purposes, such as: determining the deformation values we expect in the next phase, which can be used for consolidating when required, verifying the maximum forces the bridge can sustain without incurring major physical depreciations, verifying some hypotheses that relate to limit situations to determine how the structure will react.

Therefore deformation analysis can be a starting point for risk management, especially when we consider large constructions or constructions of great importance. The data obtained for the deformation analysis can be used in simulation systems so that forecasts can be made regarding how the construction is going to behave in case of risk situations. We can set the "alarming" parameters that can be overcome without producing irreversible effects immediately, but which can draw the attention to potential problems of those responsible. Thus decision-makers have sufficient time to verify various assumptions, to take pre-decisions and apply them so that the negative effect is diminished or eliminated.

The destruction of great constructions can lead to environmental damage, but more than that, they can affect the health and integrity of the people exploiting it, and the safety of people and the reduction of pollution are priority issues at both national and international level, which is why it is necessary to implement a risk management system.

I believe that there is the necessary data to start such a process for many constructions of great importance and I also think it would bring many benefits to the big beneficiaries, giving them the chance to prevent unwanted events and to prepare properly the construction in order not to suffer major damage.

Organisers



Partners

