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Influence of the Constructive and Operational Features on the Natural Frequencies of the Centrifuges

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Abstract: - This paper approaches a field of advanced fundamental research: the study of vibrations of industrial centrifuges considering the constructive and functional factors. It will be established special study model for centrifuges, as discrete system with two degrees of freedom. It will be studied the influence of the constructive and working specific features of these machines. The paper proposes new approaches in the subject field.

Keywords: centrifuge, vibrations, natural frequencies, operational features

The innovative concept of dynamic analysis for the movements of the viaduct modeled as solid body with elastic bearings

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Abstract: - This paper proposes an approach of six degrees dynamic model of a rigid-solid with some types of symmetries. These symmetries lead to simplified mathematical models, which are more easily to solve. If the rigid-solid is symmetrical beared by triorthogonal elastic links, the mathematical model becomes still simple and the vibrations are decoupled into four subsystems of movements: side slipping and rolling, forward motion and pitching, lifting motion, gyration. There are two case study of modal analysis: for a viaduct with five arches made from reinforced concrete „U” beam and for an arch (between two piers of the viaduct) made from four reinforced concrete „U” beam.

Keywords: - innovative concept, dynamic analysis, structural symmetry, decoupled vibration, modal calculus, reinforced concrete bridges vibrations

Studies concerning the optimization of the modal analysis of the Bechtel's viaducts – calculus of natural frequencies and eigenvalues

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Abstract: - This paper proposes an approach of the experimental study of the dynamics of a reinforced concrete bridge made by a number of twenty U beams and beared by eighty identically neoprene supports (four bearings for each concrete beam). The experiments were made in site on Transylvania highway, on the viaduct situated on km 29+602,75 - km 29+801,25 by the specialists from Vibration and Acoustic Laboratory of the Research Institute for Construction Equipment and Technology - ICECON S.A. Bucharest with the help of the Research Center of Machines, Mechanic and Technological Equipments – MECMET from Dunarea de Jos University of Galati. The vibrations of the bridge were caused by passing with different speeds of a forty tons truck over an obstacle mounted on the bridge surface. The experimental data were acquainted on three channels (accelerations on the axis x, y and z) by a four channel data acquisition interface from National Instrument (NI 9233) through the USB port of a PC workstation. The experimental data were processed by a adequate calculus programme developed on ICECON S.A. Bucharest on the basis of LabView® ver. 8.5 from National Instruments.

Keywords: - optimization, modal analysis, FFT analysis, viaduct vibrations

Dynamic analysis of the vibrations of the mechanical elastic systems using virtual instrumentation

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Abstract: - The new slogan “The software is the tool” takes into consideration a new construction principle for the measuring tools and systems, with a brand new architecture. These systems and tools are assembled into a “virtual space” computer programming environment which provides such basic elements of construction. There is a big advantage of this type of measuring system: each human user can build himself an unlimited number of instruments intended to process and to analyze experimental data; these virtual instruments on the basis of dedicated computer applications can meet individual requirements designated to cover an extended domain of analysis. The function of data acquiring of the equivalent real instrument is now taking by a new PC peripheral (DAQ - data acquisition interface). The functions of data conditioning, data analysis and control are completely taken by the existing hardware in the computer and the software package in question. The current instrument system, as a whole, is designed and developed as a part of the computer, making possible the direct use of the computing power and the

facilities of the PC. The article presents the virtual instrument developed on ICECON S.A. Bucharest on the basis of LabView® ver. 8.5 from National Instruments. The virtual instrument was used to acquire and to process some experimental data from the dynamic tests of the Bechtel viaduct at Km 29+602,75↔Km 29+801,25 on Romanian Highway A3 (“Transilvania” highway).

Keywords: - dynamic parameters, vibration measurements, virtual instrumentation

Noise Exposure in Music and Entertainment Sector. Possibilities for Control

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Abstract: - In order to determine potential causes for professional diseases and accidents is frequently used in specialized analysis regarding safety and health at work the term so called „risk factor”. The safety and health at work specialists are oriented to deepen studies of the risk factors in order to establish prevention measures, starting with potential risks of professional diseases and accidents. One of the risk factors permanently present in sounding ambiance corporate in the musical and entertainment sector is exposure to noise. Specific to music and entertainment industry is noise with high levels and special effects with extreme intensities. Higher noise levels and sound frequency can damage hearing and that could be reversible for short periods of exposure and irreversible when noise exposure increases for long periods and all that finally can cause hearing loss. Noise exposure can induce hearing deficiencies such as hiperacusia and diplacusia. Noise exposure with high levels, arised in short periods, in places like discoteques, clubs, pubs or when music is produced by a band orchestra may induce temporarily hearing loss. Noise exposure control in music and entertainment sector is a requirement of noise Directive 10/2003/CE but also is a exigency and an obligation arised from concerning for developing of a health and safety for the workers environment even this area is characterized by an enjoyable sound ambiance for entertainment consumers.

Keywords: music, entertainment, noise, risk, control, health and safety.

Mathematical Formulation of Friction Pendulum System With Multiple Sliding Interfaces

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Abstract: - The use of base isolation in developed countries has been recognized as a very effective method for upgrading the seismic resistance of the structures. The reduction in earthquake forces on a structure is achieved by adding horizontal soft isolation elements between the superstructure and the foundation. The efficiency of the isolator in reducing the seismic energy imparted to a structure is dependent on the flexibility of the supporting soil. The effects of radiation damping and the flexibility of the soil media are the deciding factors for structural design against earthquakes. In order to upgrade the

seismic resistibility of structures and enhance the functionality of an isolator, a new base isolator called the multiple friction pendulum system (MFPS) is proposed in this study.

Keywords: seismic isolation, friction pendulum system, multiple friction pendulum system, bearing

Buildings, Equipment and Pipe Networks Vibration and Noise Control using SERB – SITON Devices

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Abstract: - Buildings, equipment and pipe networks, herein below called "structures", are affected by the dynamic actions of earthquake, shocks and vibrations type, herein below called "excitations". The repeated action of excitations on structures most often lead to important built-up of kinetic and potential energy in structures. This leads to an increase of the amplitude in accelerations and displacements of structures accompanied by the occurrence of damages or destroy. The paper presents the performances of SERB-SITON isolation and telescopic devices used to protect buildings, equipment and pipe networks against dynamic actions. For large-size buildings such as nuclear power plants, old buildings, churches, bridges, etc., SERB-SITON isolation devices with a very small and adjustable stiffness installed under the structure on any horizontal direction, are presented. For reinforced concrete or metal framework buildings such as high buildings, industrial halls, towers, etc., SERB-SITON telescopic devices with controlled stiffness and damping large force inclusively are presented. For equipment and pipe networks, SERB-SITON supports that are capable to overtake large permanent loads with relative displacements on two directions for thermal displacements, and also capable to elastically overtake and damp dynamic actions, are presented. In order to reduce the propagation of the noises and to absorb them, the SERB – SITON panels are presented.

Keywords: - noise control, vibration control, isolation devices, hysteresis, seismic isolation

Industrial Noise Mapping – Support of an Anti-Noise Protection Program

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Abstract: The paper shows an approach to noise problems for an installation belonging to a complex industrial plant, containing noise sources located at different heights. A proper digital modeling of the relevant elements in terms of noise – sources with characteristics, barriers, soil absorption characteristics, receptors, is useful in assessing noise levels both in the environment and workplace, and also in noise reduction. In this paper, after a digital model was developed for a petrochemical plant installation, noise maps are made for three different heights based on ISO 9613:2006. After that, the way information from noise maps could be used in a study on noise exposure in working place according to EN ISO 9612:2009, is presented.

Keywords: industrial noise modeling, occupational noise exposure

Test Bench for Semi-Active Magnetorheological Fluid Damper Using a Modified Charpy Pendulum

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Abstract: - The paper presents an experimental stand for testing a semi-active damper with magnetorheological fluid (MRF.) For reduce costs and time of execution, the solution has been found is to alter a Charpy pendulum. Are detailed the changes and the modifications made to ensure the testing of the magnetorheological fluid dampers with different size, for a large range of forces [2]. Two models were made for pendulum-damper system and the results were interpreted.

Keywords: - Test Bench, MRF Damper, Charpy Pendulum

Dissipation Capacity Evaluation for Neoprene Anti-Seismic Isolators Under Harmonic Dynamic Excitations

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Abstract: - This paper presents the dissipation, as well as damping parameters basing on the structural analysis of the insulation systems consisting of more antivibrating elastomeric elements. Thus, the representative cases of hysteresis dissipation for kinematic and dynamic actions of the external harmonic excitation are analyzed.

Keywords: - hysteretic system, critical damping fraction

Noise reduction of a water cooler equipment (chiller)

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Abstract: - The chilling equipments of air conditioning installations – located on the flat roof – represent the sources of noise which can cause acoustical discomfort to the habitants from the neighborhood buildings.

The dissertation presents the initials results of noise level measurements due to the water cooler equipment (chiller) mounted on the flat roof in 18 Jules Michelet Str. – Bucharest, technical principle solutions to decrease this noise and the final results.

*Was proposed a constructive solution on THE PROPAGATION PATH, a certain **CHILLER SHIELDING** by means of sandwich panels. By mounting this acoustical insulating panels was obtained a noise level reduction with **19 dB** near the chiller, so the noise level propagated on the front of the building located in Magheru Bd. entered in the admissible limit of 50 dB(A), as specified in STAS 10009-88.*

Keywords: - noise level, noise reduction