Dynamic element initial energy storage excitation

With regards to the dynamic analysis of storage tanks under blast loads, several studies have been published using computational and experimental methods. ... connecting plate and pillars of the spherical storage tank, and LINK 160 elements are used to represent the links. TNT, liquefied petroleum gas and air are modeled using SOLID 164 ...

The air-gap eccentricity of motor rotor is a common fault of flywheel energy storage devices. Consequently, this paper takes a high-power energy storage flywheel rotor system as the research object, aiming to thoroughly study the flywheel rotor"s dynamic response characteristics when the induction motor rotor has initial static eccentricity.

Perry Tsao from UC Berkeley designed a 30 kW homopolar energy storage machine system for electric vehicles [9, 10].The HIA energy storage device developed by Active Power for UPS has a maximum power of 625 kW [].Yu Kexun from Huazhong University of Science and Technology designed an 18-pole homopolar energy storage machine to solve the ...

In accordance with the excitation mitigation theory of VE dampers [30], the storage modulus G 1, the loss modulus G 2, the loss factor i and energy dissipation E d can be obtained by the following equations: (14) G 1 = F 1 h v A v u 0 (15) i = F 2 F 1 (16) G 2 = i G 1 (17) E d = p G 2 A v u 0 2 h v where F 2 is the damping force at the zero ...

When a structure is subjected to any type of excitation, its response presents a combination of free and forced vibrations. Vibrations, which are caused by the initial conditions and disturbing excitation of any nature simultaneously, are called the transient vibrations. Due to the inevitable resistances, a free vibration of a system will subside with time.

8 2 Dissipativity and Passivity where C v denotes the valve coefficient and F o is the mass flow rate. The mass balance is given by rA dx(t) dt = rF i (t)-rF o (t)=rF i (t)-rC v x(t), (2.12) leading to dx(t) dt = - C v A x(t)+ 1 A F i (t), y(t)=p(t)=rgx(t), (2.13) where A is the cross-sectional area of the tank and r is the density of the liquid. Denote the mass in the tank as m ...

Polymer bonded explosives (PBXs) are a kind of particulate-reinforced composite materials that consist of high volume-fraction energetic crystals held together with a viscoelastic polymer binder as well as additives such as nitro-plasticizer antioxidant and radical inhibitor [1].As a polymer matrix composite filled with high percent explosive granule, PBXs have a wide range ...

The shock isolation performance of the QZS shock isolator will be significantly better than the corresponding

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linear shock isolator, and is a good way to achieve high shock isolation performance [45, 46].But the research on QZS shock isolator mainly focuses on dynamic characteristics and vibration isolation performance under simple harmonic excitation of small ...

This study investigates a short primary double-side six-phase linear induction motor (LIM) operating in non-periodic transient conditions. The main purpose is to solve the problems arising from the dynamic end effect. The equivalent circuit method is used for intensively studying the transient time-varying law of eddy current and excitation inductance, and the finite ...

The current frequency of excitation is marked as a square dot on the curve (if you don"t see the square dot, it means the frequency of excitation is too high to fit on the scale if you lower the excitation frequency and press `start" again you should see the dot appear). You can change the properties of the spring mass system (or the ...

Vibration, Mechanical. Marie Dillon Dahleh, William T. Thomson, in Encyclopedia of Physical Science and Technology (Third Edition), 2003. II.B.1 Harmonic Excitation. When a system is subjected to forced harmonic excitation, it vibrates at the same frequency as that of the excitation.If the excitation frequency coincides with the natural frequency of the system, large ...

Once the second excitation finishes, it comes to the second holding period. Although the excitation stops, the residual sloshing wave still spreads and causes obvious influences on three monitors" temperature profiles. During the fourth period, monitors T u 1, T u 2 and T u 3 have the most obvious variations among 20s intermittent sloshing.

elements are called dynamic circuit elements or energy storage elements. Physically, these circuit elements store energy, which they can later release back to the circuit. The response, at a given time, of circuits that contain these elements is not only related to other circuit parameters at the same time; it may also depend upon the parameters

Dynamic responses of oil storage tank are increased obviously after wind disturbance effect being considered. ... studied dynamic responses of concrete liquid storage structure under resonant excitation by finite element method based on FSI. Ozdemir et al. [5] pointed out that the particularity of liquid storage structure relative to ...

The maximum charging current of battery in the compound energy storage system is 19.8 (A) and decreases by 42.27% compared with the single battery system, which indicates that the compound energy storage system can effectively reduce the impact of large current on the battery, prolong the service life of the battery and improve the economy of ...

We model and investigate the response of a nonlinear cantilever beam under principal parametric excitation.The design is initially assessed, optimized, and tuned using three-dimensional finite element

analysis (FEA) to ensure the presence of fundamental parametric resonance and the absence of other internal and higher-order parametric resonances. The ...

Hydrogen energy is a promising renewable alternative energy and hydrogen storage obtains more interest all over the world. During the transportation of liquid hydrogen, fluid sloshing is inevitable due to low kinetic viscosity. ... The first natural frequency of the storage tank is selected as external excitation, and influence of initial ...

Although sensible heat storage is the most common method of thermal energy storage, latent heat storage systems that use Phase Change Materials (PCMs) offer higher energy density (40-80 kWh/m 3) compared to water-based storage systems and also have the advantage of the isothermal nature of the storage process, i.e. storing heat compactly in a ...

574 Journal of the Brazilian Society of Mechanical Sciences and Engineering (2021) 43:574 1 3 Page 4 of 14 interval Dt = t 2 -t 1 = nT, n ? N+.Let the inertance of the mem-inerter Bx() be a polynomial function expressed as B(x)=c(x +d)n +e, where c, d, e are rational numbers. The energies stored in the mem-inerter and inerter over the interval [t 1,t 2] are the same if, and ...

A bistable nonlinear electromagnetic energy harvester coupled to an impulsively excited primary linear oscillator has been experimentally investigated. The design of the energy harvesting system was guided by a preliminary numerical study, which predicted a favorable dynamic regime for harvesting purposes.

The classical physical models of bearings use shock sequences to characterize vibrations. McFadden and Smith [13, 14] proposed a bearing vibration model for inner race fault.The model used a periodic pulse function to express the rotation of the bearing, and multiplied the pulse function with the load distribution function, transfer function, and ...

The energy harvesting techniques that have been widely studied can be divided into electrostatic, 6 piezoelectric, 7,8 electromagnetic, 9,10 and frictional, 11,12 depending on the principle used. Piezoelectric vibration energy harvesting (PVEH) technology is the most widely researched and widely used method due to its advantages over other energy harvesting ...

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