

AL-FARABI INTERNATIONAL CONGRESS ON APPLIED SCIENCES - II

May 2-4, 2021
"Nakhchivan" University, Azerbaijan

ABSTRACT BOOK

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Edited by

Assoc. Prof. Dr. Ali HAŞIMOV
Dr. Mehman ŞABANOV

"Nakhchivan" University



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**THE EARTHQUAKES IMPACT ON STORAGE RESERVOIRS FOR
ENVIRONMENTALLY HAZARDOUS LIQUIDS**

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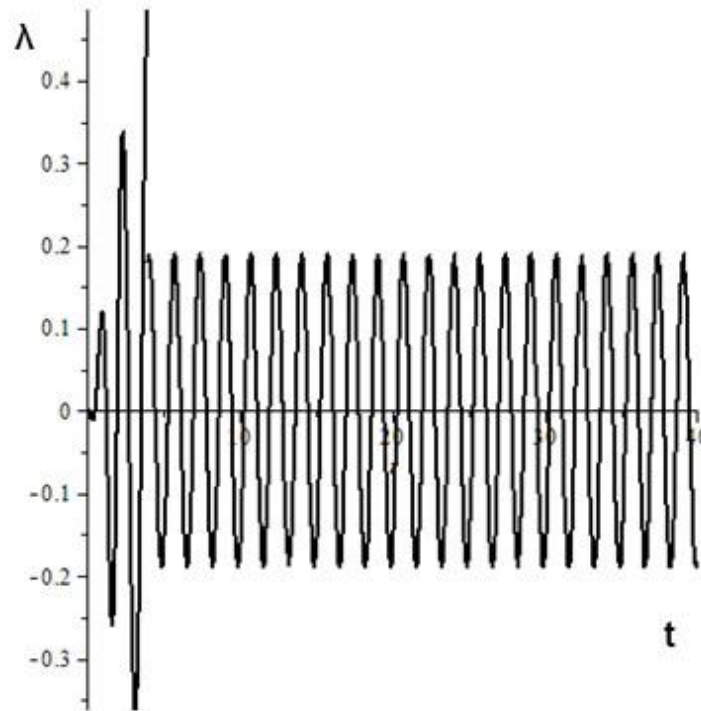
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ABSTRACT

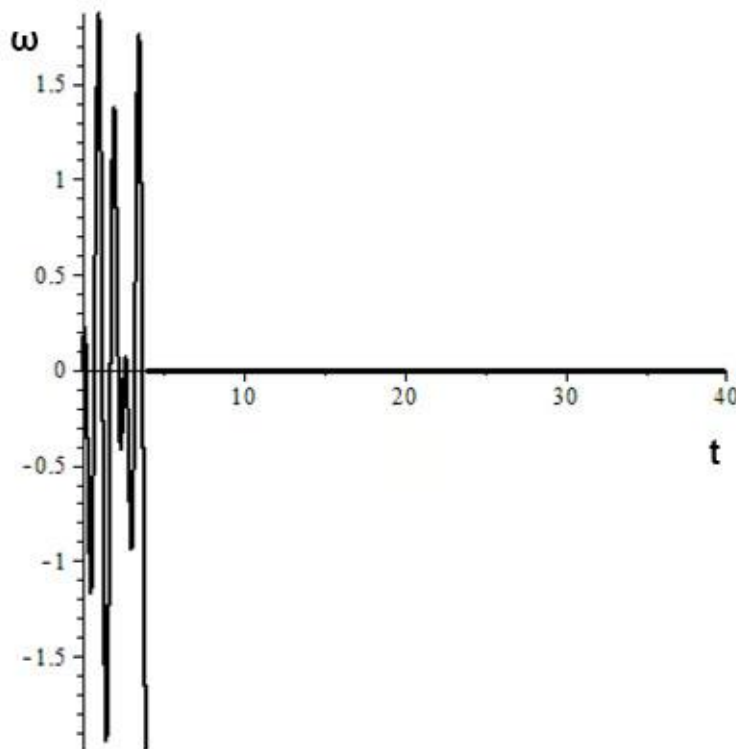
One of the current problems of mechanical engineering, energy, oil and gas industry, chemical industry is to ensure reliable, trouble-free and efficient operation of storage tanks for environmentally hazardous substances (EHS). Damage and destruction of such facilities lead to environmental pollution and emergencies. Tanks filled with EHS, even in normal operation, belong to the sources of uncontrolled emissions of vapor-gas mixtures and spills of EHS with the subsequent occurrence of fires and explosions. Reservoirs could be operated in hard-to-reach places under conditions of complex loads exposure, which often exceed the calculated values and are characterized by the most stringent conditions to preserve their integrity and prevent leakage of EHS. For environmentally hazardous facilities, it has been important to constantly monitoring their technical condition, monitoring the condition of the surrounding area, which they could affect, assess of natural and technogenic factors affecting these facilities, operational loads assess, prediction the changes in technical condition and prediction the impact of factors of various origin.

Therefore, the urgent issue has been to improve the forecasts of possible technogenic and natural impacts on reservoirs for the preservation of EHS, operated in critical conditions, to ensure their trouble-free operation and prevention of emergencies [1-3]

The seismic acceleration from an earthquake and its effect on the amplitude of liquid rise in the cylindrical tank has been provided in the paper (Pic. 1,2).



Pic. 1. The rise amplitude of the liquid in the cylindrical tank
 λ – rise amplitude of the liquid, m; t – time, sec.



Pic. 2. Seismic acceleration from the earthquake
 ω – seismic acceleration, Hz; t – time, sec.

The liquid in the tank rises by 40 cm, which could lead to liquid spillage. If the tank has completely filled with liquid, it will put excessive pressure on the tank lid. At $t = 4$ sec, the

amplitude $\lambda = 2$ m, $\omega = 2$ Hz. That corresponds to the earthquake of 6 points with the distance epicenter of 200 meters.

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