Modeling the effect of sound insulation on reducing the sound pressure level in the gas pressure reducing station

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Abstract

Among all occupational pollutants, noises have the highest levels of emissions, and there are almost every industry. Noise interferes with conversations and prevents hearing loss as one of the most common stresses and causes the occurrence of cardiovascular problems and, more importantly, reduces hearing in exposed individuals. In the City Gas Station(CGS), gas pressure is reduced from 700 psi to 250 psi, and at Town Board stations(TBS), the gas pressure is reduced from 230psi-250psi to 60psi.In gas pressure reduction stations, due to the equipment installed and the geographic location of the station, in order to maintain the safety and health of the station, appropriate measures are needed to measure noise and reduce noise. Due to the high noise pollution, the CGS and TBS gas pressure reduction stations are compared. Therefore, in this research, an appropriate modeling with Matlab and a mathematical program to analyze the intensity level of sound at different intervals from the source of sound and various frequencies and different sound power in a non-insulated

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state and in insulated mode, by changing the surface density of the insulator, it examines the effect of reducing the level of sound intensity. The most important results are:

1. Reduces the intensity of the sound by increasing the distance from the sound source. However, under operating conditions, the size of the valve=6 " , Frequency = 500HZ, Sound pressure = 2Watt, Insulation density=100kg/m^2 , the existence of an insulator with a surface density of 100 kg/m^2 would reduce the 12db level of sound level at a level between 66db to 106db became.

2-Voice intensity increases with increasing sound power at identical intervals from the sound source. However, for operating conditions, the Size of valve=6", Frequency=500HZ, Distance=25m, Insulation density=100kg /m^2 with sound power change from watt1 to 20watt Sound level levels from 6db to 11db for safe and no Insulation changes.

3. As the distance from the sound source increases, the intensity of the sound decreases with decreasing frequency. However, under operating conditions, the size of the valve=6 ", Frequency= 400HZ, Sound pressure=2Watt, Insulation density = 100kg/m^2. Sound intensity level An insulator with a surface density of 100kg/m^2 at a level between 66db and 106db reduces from about 20db to 26 db, respectively.

4. With increasing insulating surface density, the level of sound balance decreases at identical intervals. However, under operating conditions, the size of the valve=6", Frequency=500HZ, Sound pressure = 2Watt, Distance of source=25m. Insulation with a surface density of 1kg/m^2 reduces about 7db. Sound and sound level levels with a surface density of 100kg/m^2 will reduce the sound power level by about 20db.