MEAGAN ROUSE#, SAMANTHA BYRUM, JOE NOLAN, NATALIA OMELCHENKO, and STEPHANIE BRADLEY, Department: Health Sciences, West Liberty University, West Liberty, WV, 26074, Natural Sciences and Mathematics, West Liberty University, West Liberty, WV, 26074. **Alarm assessment using EEG markers of alertness.**

Recent studies indicate that more than 40% of individuals ignore alert sounds, making the improvement of the specificity of alarm systems a vital task. Here, we decided to evaluate if EEG markers may better dissect the alert effectiveness and advance alert design. Eleven university students (7 males, 4 females), with ages ranging between 18-25 years, participated as volunteer subjects. The subjects remained seated during the session with their eyes closed, while listening to the alarm sound through noise canceling headphones for 60 seconds. The alarm sound contained random bursts of sound beats (2-5 beats every 20-30 seconds). The EEG was recorded by using a LabScribe3 software package and an iWorx EEG System with five reusable gold cap electrodes, placed on the subject's forehead, over the right and left temporal lobes, and upon the parietal-occipital areas. Eight EEG markers (alpha and beta waves' amplitudes and frequencies for each hemisphere) were obtained during 10 second recordings made before and during beat bursts and compared using a paired samples T-test. A significant effect of the sound effects onto the amplitude of alpha waves recorded in the right hemisphere was detected ($t(18)=2.1$, $p=0.01$). The analysis of the rest of the EEG markers did not demonstrate any significant differences. In conclusion, the study clearly indicates that EEG markers can be used for the assessment of alert efficacy. This simple, cost effective method proposed here may greatly improve the quality of alarms and the safety of various industrial and medical settings.