

# Noise Assessment/Survey at ERAU Fleet Maintenance Hangar

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## Abstract

One of the many hazards associated with aviation, and conducting aircraft maintenance, is the issuance of noise hazards. Federal agencies such as Occupational Health and Safety Administration have incorporated standards pertaining to threshold limit values and permissible exposure limits surrounding noise in the workplace. Our objective is to assist the work environment in the Embry-Riddle aviation hangar to assure personnel are protected from lasting effects of noise through this research. The method used for research in this paper was a combination of sound monitoring of the maintenance hangar using a

sound level meter, noise dosimeter and the NIOSH Sound Level Meter application as well as using relevant previous research studies. The results of the sound monitoring determined that the noise level within the maintenance hangar was well below the OSHA Time Weighted Average of 85 dB, and the noise level peaked at 115.4 dB for a single impulse. It has been concluded that the maintenance hangar does not require a hearing conservation program at this time as the data indicates that noise levels are well within OSHA standards. However, the current data does not include the engine run-up operations.

## Introduction

- Since the beginning of aviation, there have been multiple occupational hazards associated with aviators and aircraft maintenance personnel.
- Due to the insurmountable number of hazards associated with aviation, as safety professionals, it is our duty to manage these hazards to an acceptable risk.
- One of the many hazards associated with aviation and conducting aircraft maintenance is noise hazards.
- Occupational Health and Safety Administration (OSHA): Federal agencies that have incorporated standards pertaining to threshold limit values and permissible exposure limits surrounding noise in the workplace.
- It is important that the Embry-Riddle maintenance hangar does not exceed these limits and if they are, control measures need to be put in place.

## Discussion

- Generally, maintenance facilities are known to be a very noisy work environment.
- Due to this fact it was decided that noise sampling should be done within the Embry-Riddle aviation maintenance hangar.
- There is currently no noise abatement program for the aviation maintenance hangar
- The goal was to determine if the aviation maintenance hangar needs a hearing conservation program.

## Tools Used

### Noise Sound Level Meter



NIOSH Sound Level Meter Phone Application



### Noise Dosimeter



Apple® iPhone 13 Pro Max



## Methods

### Sampling Method:

- **Sound Level Meter:** This was used to get the peak noise within the aviation maintenance hangar during the sampling session. The meter was held three feet from noise sources.
- **Personal Noise Dosimeter:** This was used to get a more accurate personal noise exposure. The dosimeter was clamped onto the clothing of one of the team members during the sampling session.
- **NIOSH Sound Level Meter Phone Application:** This phone application proved to be accurate when compared to the real sound level meter. This application was run on a team members phone during the sampling session and was held in hand three feet away from noise sources.



Noise Sampling in The Aviation Maintenance Hangar.

## Noise Control Measures

### Passive Earmuffs



### Passive Earplugs



### Active Noise Cancelling Earmuffs



### Active Noise Cancelling Earplugs



## Conclusions & Recommendations

- The Aviation Maintenance Hangar does not require a Hearing Conservation Program
- Noise exposure was within range based upon OSHA TWA limits according to federal regulation
- Based upon OSHA standards there is no requirement to change existing measures
- Personnel can wear hearing protection at their discretion during louder maintenance operations

## Results

TWA: 58.8 dB

Peak: 112.7 dB

Average Background Noise Level: 71.8 dB

### OSHA and NIOSH TWA Standards:

Time to reach 100% noise dose	Exposure level per NIOSH REL	Exposure level per OSHA PEL
8 hours	85 dBA	90 dBA
4 hours	88 dBA	95 dBA
2 hours	91 dBA	100 dBA
1 hour	94 dBA	105 dBA
30 minutes	97 dBA	110 dBA
15 minutes	100 dBA	115 dBA



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