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Assessing Excessive Noise Exposure of Music-Oriented Nightclub Employees

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Assessing Excessive Noise Exposure of Music-Oriented Nightclub Employees

by

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Dedication

This thesis is dedicated to my husband, JaCory Fitzgerald, and my children, Jayla and Jourdayn Fitzgerald. Thank you for always encouraging me to go above and beyond. Everything I do is for the betterment of our family. I love you all!

Acknowledgments

I would like to thank my grandparents, Arcephus and Mildred Kennedy, for instilling in me the importance of education. To my brother, Devin Glover, I thank you, Alexis, and Aaliyah, for supporting me on this journey. Most of all, I would like to thank my husband, JaCory Fitzgerald, for always reminding me that I have come too far and done too much to be defeated, and my children, Jayla and Jourdayn Fitzgerald for always telling me, “you can do it, Mommy”. I would like to recognize and thank Dr. Steven Mlynarek for being such a great advisor, supporter, and motivator. Furthermore, I would like to recognize and thank Dr. John Smyth, Dr. Yehia Hammad, and Dr. Thomas Bernard for taking the time to ensure that I have all of the necessary knowledge and tools to become a successful Industrial Hygienist. Last, but certainly not least, I would like to recognize and thank the United States Navy and LCDR Baer for granting me the opportunity to pursue this degree in the Navy’s Health Service Collegiate Program (HSCP).

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List of Abbreviations & Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
dBA	Decibels, A-weighting
NIHL	Noise-Induced Hearing Loss
NIOSH	National Institutes for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SLM	Sound Level Meter
TLV	Threshold Limit Value
TTS	Temporary Threshold Shift
TWA	Time Weighted Average

Abstract

Much research has gone into noise-induced hearing loss (NIHL) and the effects of high intensity noise levels on the hearing mechanism of individuals. A study by the National Institutes of Health has established that high intensity sounds can cause hearing damage of either a temporary, or worse, a permanent nature; regardless of the age of the person. While sound levels below 75 decibels are considered comparatively harmless and have been found not to cause any kind of permanent hearing loss; sound levels greater than 85 decibels and regular exposure of approximately 8 hours per day, on an average, has been found to cause permanent loss of hearing (Bulla, 2003).

The purpose of this research study was to assess excessive noise exposure of music-oriented nightclub employees, with music playing. Two employees were used as candidates for the purpose of this study, which was conducted on three days during a work week. Data on personal noise exposure was collected using personal noise dosimeters on a server and a promoter.

For purposes of the study, a sound level meter was used to collect the noise levels in the working area, and prepare a sound map. The study was conducted in a nightclub in Tampa, Florida, with music playing. Data was collected on Wednesday, Friday, and Saturday. In total, the data was collected over six sampling nights. The data on noise levels was collected for both personal noise data levels and area noise levels during the period of study. In addition to the personal dosimeters, a sound level meter was also used for data collection.

The results of this study indicate that noise levels were highest on nights with live entertainment. The days with performance of live entertainment were random and followed no particular order.

The highest TWA noise exposure of 97.3 dB, for the server, occurred on Saturday, when a live entertainer performed in the establishment. The highest TWA noise exposure of 94.3 dB, for the promoter, occurred on Wednesday. Using the OSHA PEL and OSHA Hearing Conversation measurement methods, the server was exposed to excessive noise levels, greater than 85 dBA, on every night of the study (6 nights), while the promoter had three exposures that were greater than 90 dBA, using the OSHA PEL method, and exposures greater than 85 dBA on every night of the study, using the OSHA Hearing Conservation method. However, using the ACGIH measurement method, both the Server and the Promoter were exposed to excessive noise levels every night of the study (six nights).

Introduction and Background

Noise is an intrinsic part of our lives and allows us to do myriad functions including enjoying music, communication and so on. It also has the capability to annoy and do harm. The biggest harm that can be caused by music is hearing damage, which is often identified only in advanced stages (Team pulsarinstruments plc, 2015).

The maximum noise levels permissible for individuals without using any device like ear plugs to limit the exposure, should not exceed 90 decibels over an 8-hour period (OSHA, 2015). Prolonged and regular exposure is not recommended (Lawrence & Turrentine, 2008).

Noise induced hearing loss is a commonly occurring occupational hazard, particularly in nightclubs and industries using heavy equipment. While the work profile of the persons working in the two environments is distinct and hardly share much in common, this occupational hazard comes from prolonged exposure to loud noise levels that exceed 80 decibels.

Previous research on this and similar topics has established the fact that continuous and excessive exposure to the sounds of high intensity is the major factor contributing to noise-induced hearing loss (NIHL) (Bulla, 2003). While research into NIHL has been an ongoing process, there are still many niche occupations that have not come under the purview of these studies.

In this paper, the excessive noise exposure of employees working in music-oriented nightclubs are collected from one establishment in Tampa, FL. For the purpose of sampling, two employees were selected as samples for data collection. The two employees who used personal dosimeters to enable the data collection are a server and a promoter.

It is assumed that this nightclub is representative of the entire cross section of such nightclubs in the area. The data were collected during six sampling nights. The days selected for sampling are Wednesday, Friday, and Saturday. The data so collected is assessed to establish the findings that can be found in this study.

A consortium from various professions like behavioral, healthcare, and biomedical professionals, under the guidance of the National Institutes of Health (NIH), have arrived at the following conclusions (Bulla, 2003):

- Temporary or permanent hearing loss can result from continuous exposure to the sounds of high intensity. Age is not a contributing factor to this damage to the hearing mechanism of individuals.
- The probability of sounds below 75 decibels causing serious hearing loss can be discounted.
- Continuous exposure to sound levels of 85 decibels and above during the working life of an individual will result in hearing loss over time.

These conclusions by Bulla, form the basic assumptions on the basis of which this study will be conducted. Bulla draws these conclusions on the basis of studies conducted by the National Institute for Occupational Safety and Health (NIOSH) that an estimated one in every four workers exposed to high intensity noise will manifest hearing loss as a result of this exposure. This is termed as “occupational noise exposure”. This is in sharp contrast to the understanding before 1990, wherein NIHL was associated with activities like the use of power tools, hunting using firearms, shooting as a sport, or the use of industrial machinery. This included yard work and work done as part of the construction industry.

This study was undertaken in a nightclub in Tampa, FL. It has an area that spans 6,375 Sq. ft. The interior of the nightclub has a dance floor, three drinks bars, and a food counter. A

total of 8 speakers are spread out across the night club, with each one producing a sound of 1600 to 2000 W. The speakers are spread out in different areas over the dance floor, the bar, and the seating area (VIP sections). A layout of the club can be seen in Figure 1.

The employees in the nightclub can be classified as DJs, servers, and club promoter. All three types of employees work from 10:00 pm to 3:00 am. All employees at the nightclub are exposed to noise. However, the exposure of the server is maximum while that of the club promoter is minimal as the club promoter can move in and out of the establishment at will, due to the job profile. The noise levels tend to be higher on weekends due to the huge volumes of patrons. Therefore, the weekends were considered ideal for the purpose of data collection.

The specific objectives of this study were:

- To collect personal noise exposure data for the Nightclub employees across a week, with music being played by a Disc Jockey (DJ).
- To compare the results to the Occupational Safety and Health Administration
- To determine sources of peak noise within the establishment.

Literature Review

The uniqueness of the entertainment industry lies in the fact that high intensity sounds that often lead to NIHL are considered as essential ingredients to increase the appeal to patrons (The Minister for Consumer and Employment Protection, 2003). The likelihood of persons working in places with exposure to high noise levels has a greater chance of suffering from hearing loss (Sound Advice Working Group, 2011). The Noise and Hearing-Loss Conference in 1990 listed all persons exposed to “live or recorded high-volume music” as high risk cases of damage to the hearing mechanism (Bulla, 2003). Previous studies have not included audio engineering a high risk work profile. However, present studies are almost exclusively focused on band directors and conductors; orchestras, musicians performing at live shows, DJs as well as their audiences (Bulla, 2003).

The lack of data on non-performing professionals from the music industry, including music producers, technicians, and recording engineers is a major drawback (Bulla, 2003). The exposure of employees to different levels of noise is dependent on the proximity of the source and duration of the noise (Sound Advice Working Group, 2011). The differences in opinions and conclusions derived on the basis of various studies clearly make it difficult to draw a definite conclusion on the risk of hearing loss caused as a direct result of exposure in pubs and clubs. While the potential for harm has been established, the actual number of employees who would face the problem has not yet been identified (Smeatham, 2002).

The path of noise in any venue can be classified into:

- The direct, uninterrupted path between the ears and the loudspeakers.

- The reflected path of sound that bounces off any surface.
- The structural path where sound moves through the mountings and fixings.

Various measures, like the positioning of speakers, isolation mountings and acoustic absorption, are used to limit the noise through the various paths (Sound Advice Working Group, 2011). Most of the regulations imposed on occupational noise exposure are based on the generally accepted NIHL (Smeatham, 2002).

Noise pollution caused by an increase in entertainment facilities has been identified as one of the prominent factors that impacts the quality of life across the world (Inter Noise, 2014). Hearing loss due to prolonged exposure to high intensity noise results in a Permanent Threshold Shift (PTS) of hearing that is not noticed until it reaches advanced levels (Safety Institute of Australia Ltd., 2012).

The need to ‘stop noise’ assumes great proportions in the light of current concerns that include hearing loss due to noise exposure; as well as affect communication thus increasing the risk of probable accidents as well. The places that can represent hazards to hearing include classrooms, farms, pubs and clubs, call centers, factories, construction yards, and shipyards to name just a few (Konkolewsky, 2005).

Related Studies

Bulla, published Daily Noise-Exposure of Audio Engineers: Assessment of Daily Noise-Exposures of Professional Music Recording Audio Engineers Employing OSHA PEL Criteria, in the MEIEA Journal in 2003. Data was collected using individual dosimeters and the data so collected was tabulated and analyzed to arrive at the conclusion that NIHL was commonly seen in audio engineers who were exposed to excessive levels of noise as part of their occupation.

This paper addressed the lack of empirical studies into the exposure levels of non-musical technicians and the resultant NIHL.

Lawrence and Turrentine, in 2008, conducted a study called Examination of Noise Hazards for Employees in Bar Environments. Although this study does not have a major bearing on the present study, it begs a mention due to the fact that the study looked into the impact of music on the employees and patrons of bars that played loud music (usually live entertainment). The studies recommended that workers who are regularly exposed to noise as part of their work environment should wear a hearing attenuation device like an ear plug while on their shift. They were of the opinion that it would help protect the workers from potential hearing damage due to their work environment.

Methods

Site Selection

The exposure assessment dates were selected based on the days that were convenient for the staff that was selected to participate in the study. Sampling at the study site took place on Wednesdays, Fridays, and Saturdays, starting on Saturday, February 27, 2016 to February to Friday, March 11, 2016. Live performances were scheduled for Saturday, March 5, 2016 and Friday, March 11, 2016; neither performance had a set time. However, the performance that was scheduled for Friday, March 11, 2016 was postponed.

The participants from this study site included one female server, and one male club promoter. The participants are in this study are identified as “Server” and “Promoter”. The Server’s job duties include: serving hot foods, bottles of liquor, wine, and champagne, retrieving items from the kitchen and/or stockroom, and moving around the establishment collecting empty bottles and plates from reserved VIP areas. The sole responsibility of the Promoter is to get people to attend the nightclub, via posting ads on social media sites, passing out flyers, and by word of mouth. However, when at the nightclub, the Promoter ensures that the people on his VIP list have shown up, and he buys them a drink; he ensures that “his” people are having a good time. Both the Server and the Promoter were constantly moving all night.

Personal Noise Assessment

Personal noise dosimeters (Edge eg-5 model, Oconomowoc, WI) were used to measure the amount noise that the Server and Promoter were exposed to. This model of dosimeters has

the capability to collect noise information with three different sets of measurement parameters. The three sets of measurement parameters are, OSHA Hearing Conservation – slow response, A-weighting, threshold 80 dB, exchange rate 5 dB, criterion level 90 dB; OSHA Permissible Exposure Level – slow response, A-weighting, threshold 90 dB, exchange rate 5 dB, criterion level 90 dB; and American Conference of Governmental Industrial Hygienist threshold limit value (ACGIH TLV)– slow response, A-weighting, threshold 80 dB, exchange rate 3 dB, criterion level 90 dB. While the focus was on the OSHA permissible exposure level parameters, all three settings were measured in conjunction with the other.

Programming of each dosimeter was achieved using Detection Management Software (3M, Oconomowoc, WI), two dosimeters that were used for measuring noise exposure, and the docking station charges and connects the dosimeters to the computer. Each dosimeter was calibrated pre and post usage with the manufacturer calibrator (AcoustiCal AC-300, 3M, Oconomowoc, WI). Calibration was done to ensure that dosimeters were correctly registering the level of noise; each dosimeter was calibrated at 1000 hertz (hZ) and 114.0 dB.

During sampling at the study site, the dosimeters were attached to the collar of each participant via two suspender clips that are attached to the dosimeter. Prior to attaching the dosimeters to the study participants, the dosimeters were turned on and set to begin the study (collecting noise levels) at the start of each shift. The dosimeters were left to run for 5 hours on each study night, as the nightclub is only open for 5 hours. At the end of each session, the principal investigator collected the dosimeters from the participants and stopped the study on the instruments. The recorded noise data, from each dosimeter, was then downloaded and saved using the manufacturer software (Detection Management Software, 3M, Oconomowoc, WI).

Area Noise Assessment

Area noise level monitoring was conducted in five predetermined areas of the nightclub: entrance, restroom entranceway, DJ booth, kitchen, and dance floor. The noise levels were measured using a Type 2 sound level meter (SLM) (Integrating-Averaging Sound Level Meter, Quest Technologies, Oconomowoc, WI). A type 2 instrument is used for general purpose noise measurements, and has an accuracy of ±2 dB; type 2 SLMs meet the minimum OSHA requirement for noise measurements (OSHA, n.d.). The SLM was programmed to measure area noise levels using the OSHA Noise Standard compliance method: slow response, A-weighting, 90 dB threshold, with a 5 dB exchange rate.

Before the area noise level monitoring was conducted, the SLM was calibrated using a manufacturer calibrator (Model QC-10 Calibrator, Quest Technologies, Oconomowoc, WI). The SLM was calibrated at 1,000 Hz and 114 dB each day, before the beginning of the study and at the end of the study. Figure 1 is a layout of the study site that labels the areas listed above. The layout shows the approximate locations where the area noise levels were measured. Area noise levels were measured at the beginning of each study night, along with two additional measurements taken 2 hours after the initial measurement, and the other 30 minutes prior to the end of the study, each study night.

To ensure that accurate noise levels were being measured by the SLM, it was held at arm's length to the side of the principal investigator, to reduce the effects of the body on the measurements. Area sampling was conducted on each study night. After the noise levels were measured, they were then documented and put into a table.

IMAGE IS NOT TO SCALE

Figure 1 – Layout of Establishment.
(*Stars: locations of area measurement; squares: speakers on banister; triangles: speakers on stand*)

Results

Personal Noise Exposure Results

Table I: Sampling Days

Amount of Sampling Days											
	Sat.	Wed.	Thur.	Fri.	Sat.	Sun.	Wed.	Thur.	Fri.	Sat.	**Total**
Server	X	X		X	x		X		X		6
Promoter	X	X		X	x		X		X		6

X: Only DJ present
x: DJ and live performer present

During this study, sampling was conducted on six (non-consecutive nights). The personal sampling results from each study day are shown in the tables and figures below.

Server

Table II: Server OSHA PEL Method Personal Noise Exposure†‡

Days of Study	**8 hour TWA (dBA)**	**8-hour Percent Dose (%)**
Saturday (2/27/16)	94	176
Wednesday (3/2/16)	95	187
Friday (3/4/16)	96	223
Saturday (3/5/16)	97	278
Wednesday (3/9/16)	96	245
Friday (3/11/16)	95	211

†Measurement Parameters: A-weighting, 90 dBA criteria threshold, 5 dB exchange rate, slow response
‡Data is projected from 5 sampling hours

The Server's OSHA PEL 8-hour TWA for personal noise exposures ranged from 94 dBA to 97 dBA. The overall mean was 96 dBA of the 8-hour TWAs for the six days. The Server's percent of dose ranged from 176% to 245%, with an overall average of 220%. Under this measurement method, the Server exceeded the OSHA PEL of 90 dBA, for an 8 hour TWA, on every night of the study. The Server also exceeded the OSHA Hearing Conservation Amendment requirements of 85 dBA, for an 8-hour TWA, on every day of the study.

Table III: Server OSHA Hearing Conservation Method Personal Noise Exposure†‡

Days of Study	**8 hour TWA (dBA)**	**8-hour Percent Dose (%)**
Saturday (2/27/16)	94	186
Wednesday (3/2/16)	95	202
Friday (3/4/16)	96	229
Saturday (3/5/16)	97	278
Wednesday (3/9/16)	96	246
Friday (3/11/16)	96	221

†Measurement Parameters: A-weighting, 80 dBA criteria threshold, 5 dB exchange rate, slow response
‡Data projected from 5 sampling hours

The Server's OSHA Hearing Conservation Method 8-hour TWA for personal noise exposures ranged from 94 dBA to 97 dBA. The overall mean was 96 dBA of the 8-hour TWAs for the six days. The Server's percent of dose ranged from 186% to 278%, with an overall average of 227.0%. Under this measurement method, the Server exceeded the Hearing Conservation Amendment requirements of 85 dBA, for an 8 hour TWA, on every day of the

study. Much like the exceedance noted under the OSHA PEL method of 90 dBA, for an 8-hour TWA.

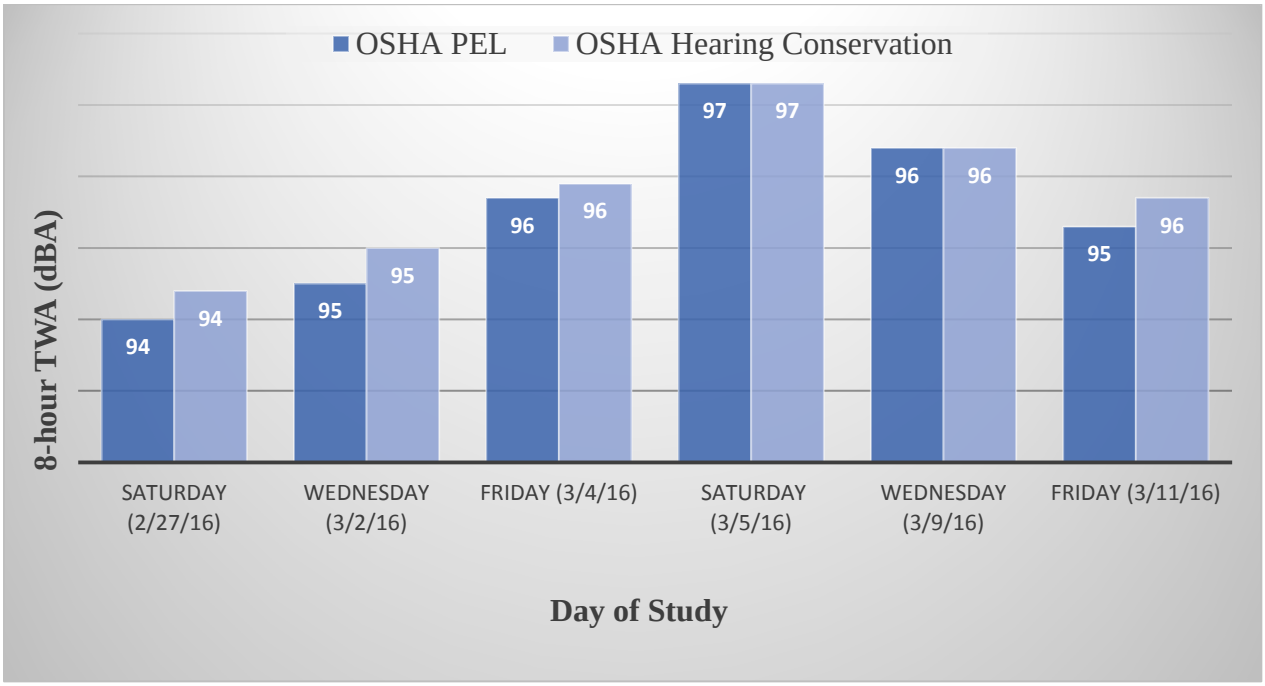

Figure 2 – Comparison of 8-hour TWAs for Server.

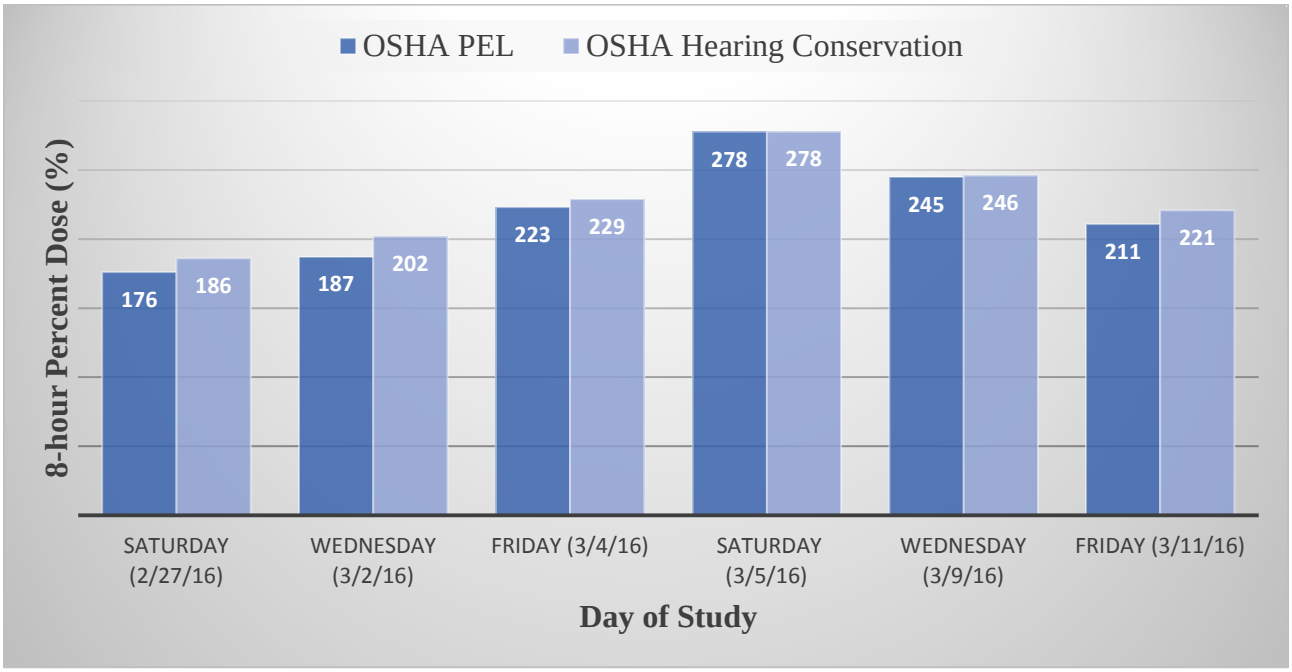

Figure 3 – Comparison of Percent of Dose for Server.

Table IV: Server ACGIH Method Personal Noise Exposure†‡

Days of Study	8 hour TWA (dBA)	8-hour Percent Dose (%)
Saturday (2/27/16)	95	331
Wednesday (3/2/16)	96	376
Friday (3/4/16)	97	505
Saturday (3/5/16)	98	565
Wednesday (3/9/16)	97	472
Friday (3/11/16)	97	472

†Measurement Parameters: A-weighting, 80 dBA criteria threshold, 3 dB exchange rate, slow response
‡Data projected from 5 sampling hours

Using the ACGIH measurement method, the Server was exposed to excessive noise levels on every night of the study. Much like the limit was exceeded on every night of the study under the OSHA PEL; this can be seen in Table II.

Table V: Server Peak Noise Exposure

Days of Study	Peak Noise Level	Noise Source/Location
Saturday (2/27/16)	147	Taking order near speaker; DJ booth
Wednesday (3/2/16)	146	Taking order/yelling to be heard; the fireplace VIP
Friday (3/4/16)	154	Patrons yelling drink orders; bar
Saturday (3/5/16)	133	Lots of yelling patrons; live performance; all over
Wednesday (3/9/16)	132	Shouting food orders; kitchen
Friday (3/11/16)	150	Patrons yelling drink orders; bar

†*Peak Noise Levels in dBA*

The Server's peak noise exposures ranged from 132 dBA to 154 dBA. The highest peak noise level measured for the Server, during this study, occurred on the Friday (3/4/16) of this study. The highest peak noise exposures was observed to occur on Latin nights, shortly after the last call for $3 drinks; last call for $3 drinks was at 1 a.m.

Promoter

Table VI: Promoter OSHA PEL Method Personal Noise Exposure†‡

Days of Study	8 hour TWA (dBA)	8-hour Percent Dose (%)
Saturday (2/27/16)	89	87
Wednesday (3/2/16)	92	134
Friday (3/4/16)	90	95
Saturday (3/5/16)	79	22
Wednesday (3/9/16)	94	183
Friday (3/11/16)	91	114

†Measurement Parameters: A-weighting, 90 dBA criteria threshold, 5 dB exchange rate, slow response
‡Data projected from 5 sampling hours 8-hour TWA from 5 hours

The Promoter's OSHA PEL 8-hour TWA for personal noise exposures ranged from 79 dBA to 94 dBA. The overall mean was 89 dBA of the 8-hour TWAs for the six days. The Promoter's percent of dose ranged from 22% to 183%, with an overall average of 106.0%. Under this measurement method, the Promoter exceeded the OSHA PEL of 90 dBA, for an 8 hour TWA, on 3 out of 6 nights, during this study. The Promoter also exceeded the OSHA Hearing Conservation Amendment requirements of 85 dBA, for an 8-hour TWA, on 6 nights, duirng the study.

Table VII: Promoter OSHA Hearing Conservation Method Personal Noise Exposure†‡

Days of Study	**8 hour TWA (dBA)**	**8-hour Percent Dose (%)**
Saturday (2/27/16)	91	217
Wednesday (3/2/16)	93	291
Friday (3/4/16)	91	217
Saturday (3/5/16)	87	130
Wednesday (3/9/16)	94	368
Friday (3/11/16)	92	271

†Measurement Parameters: A-weighting, 80 dBA criteria threshold, 5 dB exchange rate, slow response
‡Data projected from 5 sampling hours

The Promoter's noise exposure OSHA Hearing Conservation Method 8-hour TWA for personal noise exposures ranged from 87 dBA to 94 dBA. The overall mean was 91 dBA of the 8-hour TWAs for the six days. The Promoter's percent of dose ranged from 130% to 368%, with an overall average of 249%. Under this method, the Server exceeded the OSHA Hearing Conservation Amendment requirements of 85 dBA, for an 8-hour TWA, on every night of the study. Unlike the exceedances noted under the OSHA PEL of 90 dBA, for an 8 hour TWA, during this study.

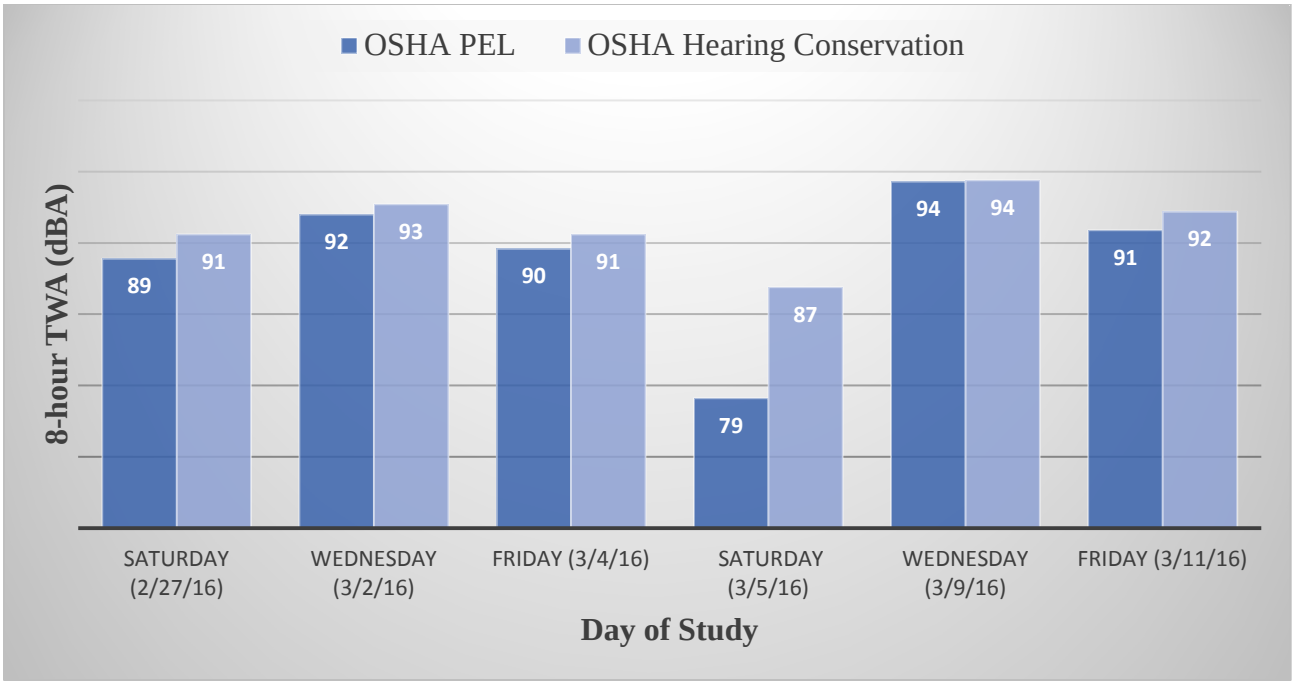

Figure 4 – Comparison of 8-hour TWAs for Promoter.

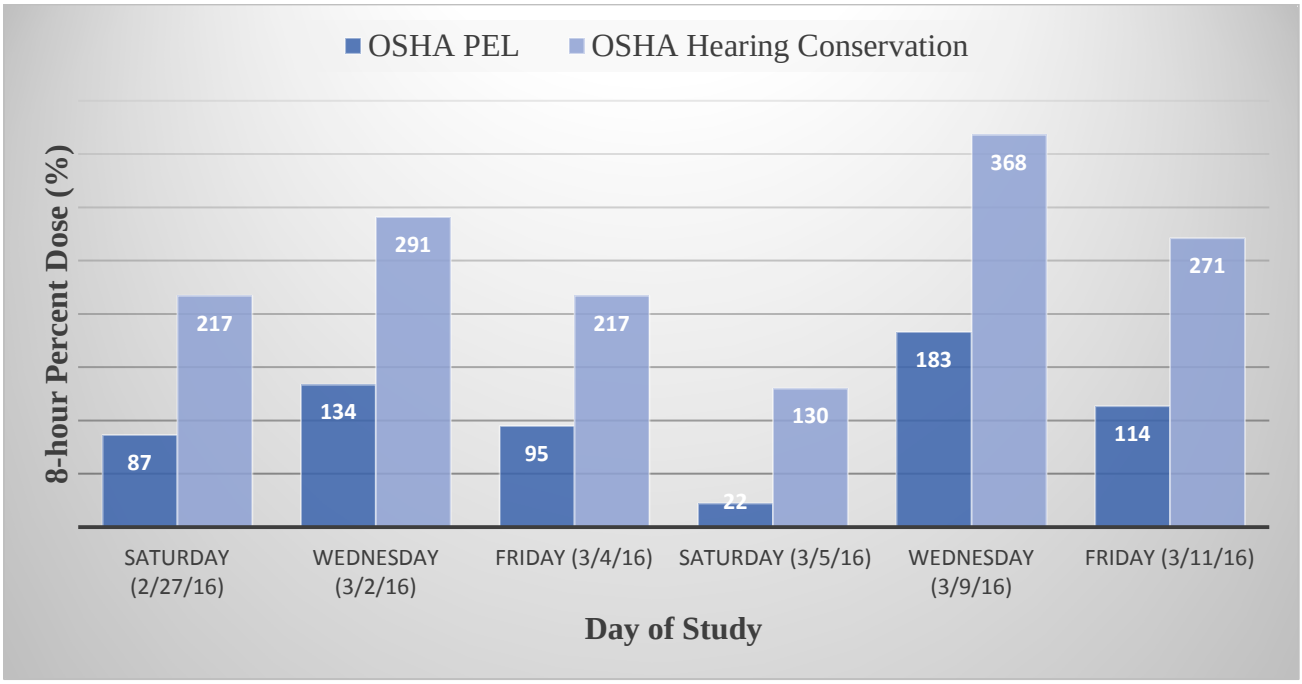

Figure 5 – Comparison of Percent of Dose for Promoter.

Table VIII: Promoter ACGIH Method Personal Noise Exposure†‡

Days of Study	8 hour TWA (dBA)	8-hour Percent Dose (%)
Saturday (2/27/16)	91	141
Wednesday (3/2/16)	94	228
Friday (3/4/16)	92	149
Saturday (3/5/16)	88	104
Wednesday (3/9/16)	95	287
Friday (3/11/16)	93	208

†Measurement Parameters: A-weighting, 80 dBA criteria threshold, 3 dB exchange rate, slow response
‡Data projected from 5 sampling hours

Using the ACGIH measurement method, the Promoter was exposed to excessive noise levels on every night of the study. Whereas, under the OSHA PEL, the limit was never exceeded; this can be seen in Table VI.

Table IX: Promoter Peak Noise Exposure†

Days of Study	Peak Noise Level	Noise Source/Location
Saturday (2/27/16)	130	Hanging out near speaker; outside DJ Booth
Wednesday (3/2/16)	129	In private VIP with exotic dancers
Friday (3/4/16)	135	Listening to loud music at car; outside
Saturday (3/5/16)	128	In private VIP with exotic dancers
Wednesday (3/9/16)	116	Listening to loud music at car; outside
Friday (3/11/16)	134	Near speaker; on stage

†*Peak Noise Levels in dBA*

Area Noise Results

Table X: Average Area Noise Data†

Days of Study	**Areas in Establishment**				
	Entrance	***Restroom Entranceway***	***DJ Booth***	***Kitchen***	***Dance Floor***
Saturday (2/27/16)	87	78	86	84	101
Wednesday (3/2/16)	81	79	85	85	100
Friday (3/4/16)	85	79	85	85	101
Saturday (3/5/16)	86	78	88	85	103
Wednesday (3/9/16)	81	78	85	84	100
Friday (3/11/16)	85	80	86	86	101

†All numbers in dBA

The highest levels of area noise occurred on the dance floor, on the night of Saturday (3/5/16), when a popular live entertainer was set to perform; the nightclub expeirienced its most patron on this night, during the study. The area of the establishment that experienced the lowest levels of area noise on any night was the restroom entranceway. The entrance, DJ booth, and kitchen area all experienced similar levels of area noise.

Discussion

Every night at the establishment had a different theme, as far as the music was concerned. Wednesdays are for mainstream music, such as a little pop mixed with a bit of hip-hop. Fridays are for Latin music, and Saturdays are for hip-hop music. The number of patrons in attendance at the establishment varied on each night of the study. Although no headcounts were taken, the highest number of patrons in attendance at the establishment was on Saturdays; approximately 350 – 450 customers were in the establishment at any given time. Fridays had the lowest amount of patrons in attendance, with aproximately 200 – 300 patrons in the nightclub at any given time. It is belived that business was low on Fridays because of the type of music that was being played. However, there were some regular Friday night patrons that were observed in attendance for Latin Fridays.

The live entertainer that performed on Saturday night (3/5/16) brought out a very large crowd; there seemed to be very little room to move (dance) and really enjoy the atmosphere. The entertainer performed some of his singles that are popular on the radio. The entertainer was surrounded by security. So, in order to speak with him, one would have had to purchase a VIP/backstage ticket.

Personal Noise Exposure

Server

The Server's job duties include serving hot foods, bottles of liquor, wine, and champagne, retrieving items from the kitchen and/or stockroom, and moving around the

establishment collecting empty bottles and plates from reserved VIP areas. Both the Server and the Promoter were constantly moving all night.

Using the OSHA PEL method, the Server's 8-hour TWA for personal noise exposures ranged from 94 dBA to 97 dBA. The Server was exposed to noise levels that were exceedingly high on every night of the study; under this measurement method, the Server exceeded the OSHA PEL of 90 dBA, for an 8 hour TWA, on every night that sampling took place, during this study.

However, using the OSHA Hearing Conservation Amendment requirements, the Server's 8-hour TWA for personal noise exposures ranged from 94 dBA to 97 dBA. Under this method, the Server was exposed to noise levels that exceeded the standards of 85 dBA, for an 8 hour TWA, on every night of the study; the exceedances can be seen in Table III.

Research has shown that the OSHA PEL noise regualtions are less strict than that of what the ACGIH requires, as it pertains to the amount of noise that one can be exposed to in an 8-hour time period. The current ACGIH standard is very similar to the standard of the OSHA Hearing Conservation Amendment. The difference between the standards of the ACGIH and the OSHA Hearing Conservation is the exchange rate. The exchange rate for ACGIH is 3 dB, and the exhange rate for the OSHA Hearing Conservation is 5 dB (Toor, 2013). In Table IV, the personal noise exposure of the Server, under the ACGIH method, can be seen.

Promoter

The sole responsibility of the Promoter is to get people to attend the nightclub, via posting ads on social media sites, passing out flyers, and by word of mouth. However, when at the nightclub, the Promoter ensures that the people on his VIP list have shown up, and he buys

them a drink; he ensures that “his” people are having a good time. Both the Server and the Promoter were constantly moving all night.

Using the OSHA PEL method, the Promoter’s 8-hour TWA for personal noise exposures ranged from 79 dBA to 94 dBA. Under this method, the Promoter was exposed to noise levels that exceeded the OSHA PEL of 90 dBA, for an 8 hour TWA, on Wednesday (3/2/16), Wednesday (3/9/16), and Friday (3/11/16). However, using the OSHA Hearing Conservation Amendment requirements, the Promoter’s 8-hour TWA for personal noise exposures ranged from 87 dBA to 94 dBA. Under this method, the Promoter was exposed to noise levels that exceeded the standards of 85 dBA, for an 8 hour TWA, on every night of the study; the exceedances can be seen in Table VII.

The difference in the days that an exceedance occurred can be asssociated with the difference in threshold criteria for each standard. The threshold criteria for the OSHA PEL is 90 dBA, where all noise exposures of 90 dBA or greater must be used in calculating the 8-hour TWA. The criteria threshold for the OSHA Hearing Conservation Amendment, on the other hand is 85 dBA, but all noise exposures of 80 dBA or greater must be used in calculating the 8-hour TWA. Again, research has shown that the OSHA PEL noise regualtions are less strict than the ACGIH requires, as it pertains to the amount of decibels that one can be exposed to in an 8-hour time period. (Toor, 2013). In Table VIII, the personal noise exposure of the Promoter, under the ACGIH method, can be seen.

Personal Noise Exposure Comparison

The differences in personal noise exposure experienced by the Server and the Promoter is due to their different job duties and locations within the nightclub, throughout each

night of the study. The Server was mobile, inside of the nightclub, all night. Being inside of the nightclub with loud music playing, the Server needed to speak and be spoken to loudly, when interacting with patrons. Whereas, the Promoter was able to move in an out of the nightclub at his leisure. The Promoter was able to take a break from the excessive amounts of noise. In an informal interview with both the Server and the Promoter, it was found that while they do experience some ringing in the ears, at the end of their shifts, they are "used to it" and knew that it came along with the job.

Peak Noise

Noise causes pain at the upper end of human hearing (OSHA, n.d). Research has shown that some quote the threshold of pain for human hearing to be between 120 dB – 140 dB. However, OSHA (n.d.) states that pain occurs at 140 dB on the decibel scale. Peak noise occurred at random times on each study night, for both the Server and the Promoter. Based on the threshold of pain being 140 dB, and analyzing the peak noise of both the Server and the Promoter, it can be determined that the Server experienced peak noise over the threshold of pain on 4 out of the 6 study nights. The Server experienced peak noise over the threshold of pain on Saturday (2/27/16), Wednesday (3/2/16), Friday (3/4/16), and Friday (3/11/16). However, the Promoter never experienced peak noise over the threshold of pain. The Promoter's highest peak noise was 135 dBA, which is 5 dB less than the threshold of pain, which is similar to the what one would experience if exposed to a jet taking off.

Area Noise

Area noise level monitoring was conducted in five predetermined areas of the nightclub: entrance, restroom entranceway, DJ booth, kitchen, and dance floor. Area noise levels were measured at the beginning of each study night, along with two additional measurements taken 2 hours after the initial measurement, and the other 30 minutes prior to the end of the study, each study night. The noise levels were measured using a Type 2 sound level meter (SLM). The SLM was programmed to measure area noise levels using the OSHA Noise Standard compliance method: slow response, A-weighting, 90 dB threshold, with a 5 dB exchange rate. Before the area noise level monitoring was conducted, the SLM was calibrated using a manufacturer calibrator. To ensure that accurate noise levels were being measured by the SLM, it was held at arm's length to the side of the principal investigator, to reduce the effects of the body on the measurements.

The dance floor was the area with the highest level of noise during the study. The average noise level in that area was 101 dBA. The dance floor is an open area with VIP areas positioned nearby. The high level of noise in this area is more than likely due to the speakers being located strategically placed around the dance floor.

The restroom entranceway was the area with the lowest level of noise during the study. The average noise level in this area was 79 dBA. The bathroom entranceway is opposite the dance floor, and has no speakers is close proximity. The low level of noise in this area is more than likely due to the location of the restroom entranceway, and the placement of speakers.

The entrance and kitchen had averages that were close in decibels; 84 dBA and 85 dBA, respectively. The level of noise in the entrance could be due to the patrons outside not making a great deal of noise while waiting to get in. The level of noise in the kitchen could be due to it

being in a completely different room, and having a wall to block some of the noise of the patrons.

Comparison with Previous Studies

There have been other studies that have focused on noise exposure in bars, nightclubs, and other music-oriented settings. In similar respects to this study, they focused on noise exposure during peak nights of business, such as Fridays and Saturdays, while also focusing on just the amount of noise in the establishment, or on the noise that bartenders are exposed to. This study is different in the fact that noise levels were also collected on Wednesdays, a day that most people do not frequent nightclubs. Unlike Bulla (2003), this study was conducted in a music-oriented nightclub, and the dosimeters were not worn all day, during the subjects every day activities. Unlike, Lawrence & Turrentine (2008) the dosimeters were worn by the workers and not the investigator(s). However, the results from area sampling, in this study, were similar to that of the personal sampling results in the study done by Lawrence & Turrentine.

Study Limitations

The primary limitation of the study was the fact that the data was collected only on three days out of a normal work week, for a total of six days. This may have resulted in skewed data, since two of the days selected for the purpose of data collection were ones with maximum patrons and higher noise levels. Another limitation was the amount of workers that were used, as more workers would have allowed for a more accurate determination of the level of noise that workers are exposed to in music-oriented nightclubs. Furthermore, this study was limited due to not being able to have other music-oriented nightclubs participate in this study, as being able to

compare the data between nightclubs could have help determine if there were other factors, such as location, patron types, amount of patrons, or nightclub size played a role in the noise levels that the workers are exposed to.

Future Research

Future research should involve the participation of more music-oriented nightclubs and a variety of workers. Future studies could also include the use of dosimeters being worn throughout the day, while the workers engage in their everyday activities. This could help in determining the true amount of noise that the workers are exposed to, as they could very well be overexposed by listening to loud music in their car or at home, watching their televisions at a high volume, hanging out at a sporting event, etc. Additional research could also be done for area noise in establishments with music involved, such as concerts, nightclubs, bars, and sporting events.

Conclusions

The purpose of this research study was to assess excessive noise exposure of music-oriented nightclub employees, at a nightclub establishment in the Tampa Bay area, and to determine if they were being overexposed to loud noises via music. The data presented in this study suggests that the server did exceed the OSHA PEL and the OSHA Hearing Conservation Amendment on every night of the study. While the promoter exceeded the OSHA PEL on three nights of the study, but exceeded the OSHA Hearing Conservation Amendment on all six nights of the study.

The differences between the server's and promoter's noise level ranges infer that their locations, during the study nights, had an effect on the noise levels that they experienced while working. It is concluded that employees working within music-oriented nightclubs are exposed to excessive noise levels. Although area noise cannot be used to speak to one's personal exposure to noise levels, it can be concluded that the patrons are exposed to noise levels that are excessive when in attendance.

Public exposure to people in places that offer entertainment is a choice. So, while nightclubs are under no obligation to be in compliance with OSHA noise standards, due to employing so few employees (OSHA, n.d.), it would be responsible and beneficial for nightclub employers to have a hearing conservation program, as well as, inform present and future employees of the potential side effects of exposure to excessive noise levels.

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Appendix A:

IRB Determination Letter

USF
UNIVERSITY OF
SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX(813)974-7091

January 27, 2016

Aiyanna Fitzgerald
Environmental and Occupational Health
Tampa, FL 33612

RE: **Not Human Subjects Research Determination**
IRB#: Pro00024722
Title: Assessing Excessive Noise Exposure of Music-Oriented Nightclub Employees

Dear Ms. Fitzgerald:

The Institutional Review Board (IRB) has reviewed your application and determined the activities do not meet the definition of human subjects research. Therefore, this project is not under the purview of the USF IRB and approval is not required. If the scope of your project changes in the future, please contact the IRB for further guidance.

All research activities, regardless of the level of IRB oversight, must be conducted in a manner that is consistent with the ethical principles of your profession. Please note that there may be requirements under the HIPAA Privacy Rule that apply to the information/data you will utilize. For further information, please contact a HIPAA Program administrator at 813-974-5638.

We appreciate your dedication to the ethical conduct of research at the University of South Florida. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John A Schinka, Ph.D.

John Schinka, Ph.D., Chairperson
USF Institutional Review Board

Appendix B:

List of Equipment and Instrumentation

3M AcoustiCal AC-300 Calibrator
Model No.: AC-300
Serial No.: AC300004123
Calibration Date: 08/22/2014
3M Detection Solutions
1060 Corporate Center Drive
Oconomowoc, WI 53066

3M Edge 5 Personal Noise Dosimeter (2)
Model No: eg5
Serial No.: ESN080202, ESN080203
Manufacturer Calibration Date: 08/20/2014
3M Detection Solutions
1060 Corporate Center Drive
Oconomowoc, WI 53066

Precision Integrating-Averaging Sound Level Meter
Model No.: 2200
Serial No.: S06130
Quest Technologies (a division of 3M)
1060 Corporate Center Drive
Oconomowoc, WI 53066

Sound Calibrator
Model No.: QC-10
Serial No.: QF-7050032
Quest Technologies (a division of 3M)
1060 Corporate Center Drive
Oconomowoc, WI 53066

Appendix C:

Personal Noise Monitoring Reports

Session Report

3/29/2016

General Information

Name	ESN080202_20160227_155724
Comments	
Start Time	2/27/2016 10:01:23 PM
Stop Time	2/28/2016 3:03:28 AM
Run Time	05:02:05
Model Type	Edge eg-5
Serial Number	ESN080202
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	88.2 %	Pdose (8:00)	1	186.1 %
Lavg	1	94.4 dB	Leq	1	--
TWA	1	89 dB	UL Time	1	00:00:00
SEL	1	163.1 dB	ProjectedTWA (8:00)	1	94.4 dB
Mntime	1	2/27/2016 10:38:19 PM	Mxtime	1	2/28/2016 1:36:28 AM
PKtime	1	2/27/2016 11:56:22 PM	Lasmx	1	109.1 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	62.6 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	146.9 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Page 1

Dosimeter Name	1	OSHA HC			
Dose	2	83.4 %	Pdose (8:00)	2	176 %
Lavg	2	94 dB	Leq	2	--
TWA	2	88.6 dB	UL Time	2	00:00:00
SEL	2	162.7 dB	ProjectedTWA (8:00)	2	94 dB
Mntime	2	2/27/2016 10:38:19 PM	Mxtime	2	2/28/2016 1:36:28 AM
PKtime	2	2/27/2016 11:56:22 PM	Lasmx	2	109.1 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	62.6 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	146.9 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	156.9 %	Pdose (8:00)	3	331.1 %
Lavg	3	95.1 dB	Leq	3	--
TWA	3	91.9 dB	UL Time	3	00:00:00
SEL	3	136.5 dB	ProjectedTWA (8:00)	3	95.1 dB
Mntime	3	2/27/2016 10:38:19 PM	Mxtime	3	2/28/2016 1:36:19 AM
PKtime	3	2/27/2016 11:56:22 PM	Lasmx	3	109.1 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	62.6 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	146.9 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080202_20160302_156618
Comments	
Start Time	3/2/2016 10:00:38 PM
Stop Time	3/3/2016 3:02:15 AM
Run Time	05:01:37
Model Type	Edge eg-5
Serial Number	ESN080202
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	97.5 %	Pdose (8:00)	1	201.9 %
Lavg	1	95 dB	Leq	1	--
TWA	1	89.8 dB	UL Time	1	00:00:00
SEL	1	163.8 dB	ProjectedTWA (8:00)	1	95 dB
Mntime	1	3/2/2016 10:23:07 PM	Mxtime	1	3/3/2016 12:56:10 AM
PKtime	1	3/3/2016 12:11:00 AM	Lasmx	1	107.9 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	62.3 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	145.8 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	90.4 %	Pdose (8:00)	2	187.3 %
Lavg	2	94.5 dB	Leq	2	--
TWA	2	89.2 dB	UL Time	2	00:00:00
SEL	2	163.3 dB	ProjectedTWA (8:00)	2	94.5 dB
Mntime	2	3/2/2016 10:23:07 PM	Mxtime	2	3/3/2016 12:56:10 AM
PKtime	2	3/3/2016 12:11:00 AM	Lasmx	2	107.9 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	62.3 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	145.8 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	181.4 %	Pdose (8:00)	3	375.7 %
Lavg	3	95.7 dB	Leq	3	--
TWA	3	92.5 dB	UL Time	3	00:00:00
SEL	3	137.1 dB	ProjectedTWA (8:00)	3	95.7 dB
Mntime	3	3/2/2016 10:23:07 PM	Mxtime	3	3/3/2016 12:56:10 AM
PKtime	3	3/3/2016 12:11:00 AM	Lasmx	3	107.9 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	62.3 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	145.8 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080202_20160304_156675
Comments	
Start Time	3/4/2016 10:04:03 PM
Stop Time	3/5/2016 3:05:56 AM
Run Time	05:01:53
Model Type	Edge eg-5
Serial Number	ESN080202
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	119.6 %	Pdose (8:00)	1	228.9 %
Lavg	1	95.9 dB	Leq	1	--
TWA	1	91.2 dB	UL Time	1	00:00:00
SEL	1	165.3 dB	ProjectedTWA (8:00)	1	95.9 dB
Mntime	1	3/4/2016 10:26:13 PM	Mxtime	1	3/5/2016 12:20:17 AM
PKtime	1	3/5/2016 1:12:44 AM	Lasmx	1	108.4 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	60.9 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	153.9 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	116.6 %	Pdose (8:00)	2	223.1 %
Lavg	2	95.7 dB	Leq	2	--
TWA	2	91.1 dB	UL Time	2	00:00:00
SEL	2	165.1 dB	ProjectedTWA (8:00)	2	95.7 dB
Mntime	2	3/4/2016 10:26:13 PM	Mxtime	2	3/5/2016 12:20:17 AM
PKtime	2	3/5/2016 1:12:44 AM	Lasmx	2	108.4 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	60.9 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	153.9 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	263.7 %	Pdose (8:00)	3	504.6 %
Lavg	3	97 dB	Leq	3	--
TWA	3	94.2 dB	UL Time	3	00:00:00
SEL	3	138.8 dB	ProjectedTWA (8:00)	3	97 dB
Mntime	3	3/4/2016 10:26:13 PM	Mxtime	3	3/5/2016 12:20:17 AM
PKtime	3	3/5/2016 1:12:44 AM	Lasmx	3	108.4 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	60.9 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	153.9 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080202_20160305_156703
Comments	
Start Time	3/5/2016 10:02:57 PM
Stop Time	3/6/2016 3:03:28 AM
Run Time	05:01:31
Model Type	Edge eg-5
Serial Number	ESN080202
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	157.3 %	Pdose (8:00)	1	277.9 %
Lavg	1	97.3 dB	Leq	1	--
TWA	1	93.2 dB	UL Time	1	00:00:00
SEL	1	167.3 dB	ProjectedTWA (8:00)	1	97.3 dB
Mntime	1	3/5/2016 11:09:15 PM	Mxtime	1	3/6/2016 1:07:14 AM
PKtime	1	3/6/2016 12:06:10 AM	Lasmx	1	104.9 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	80.3 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	132.9 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	157.2 %	Pdose (8:00)	2	277.7 %
Lavg	2	97.3 dB	Leq	2	--
TWA	2	93.2 dB	UL Time	2	00:00:00
SEL	2	167.3 dB	ProjectedTWA (8:00)	2	97.3 dB
Mntime	2	3/5/2016 11:09:15 PM	Mxtime	2	3/6/2016 1:07:14 AM
PKtime	2	3/6/2016 12:06:10 AM	Lasmx	2	104.9 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	80.3 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	132.9 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	320 %	Pdose (8:00)	3	565.2 %
Lavg	3	97.5 dB	Leq	3	--
TWA	3	95 dB	UL Time	3	00:00:00
SEL	3	139.6 dB	ProjectedTWA (8:00)	3	97.5 dB
Mntime	3	3/5/2016 11:09:15 PM	Mxtime	3	3/6/2016 1:07:14 AM
PKtime	3	3/6/2016 12:06:10 AM	Lasmx	3	104.9 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	80.3 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	132.9 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080202_20160309_157208
Comments	
Start Time	3/9/2016 10:05:23 PM
Stop Time	3/10/2016 3:06:46 AM
Run Time	05:01:23
Model Type	Edge eg-5
Serial Number	ESN080202
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	130 %	Pdose (8:00)	1	246.1 %
Lavg	1	96.4 dB	Leq	1	--
TWA	1	91.8 dB	UL Time	1	00:00:00
SEL	1	165.9 dB	ProjectedTWA (8:00)	1	96.4 dB
Mntime	1	3/9/2016 10:54:11 PM	Mxtime	1	3/9/2016 11:24:19 PM
PKtime	1	3/10/2016 1:18:03 AM	Lasmx	1	109.5 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	76.3 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	132.1 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	129.5 %	Pdose (8:00)	2	245.1 %
Lavg	2	96.4 dB	Leq	2	--
TWA	2	91.8 dB	UL Time	2	00:00:00
SEL	2	165.9 dB	ProjectedTWA (8:00)	2	96.4 dB
Mntime	2	3/9/2016 10:54:11 PM	Mxtime	2	3/9/2016 11:24:19 PM
PKtime	2	3/10/2016 1:18:03 AM	Lasmx	2	109.5 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	76.3 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	132.1 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	249.6 %	Pdose (8:00)	3	472.4 %
Lavg	3	96.7 dB	Leq	3	--
TWA	3	93.9 dB	UL Time	3	00:00:00
SEL	3	138.5 dB	ProjectedTWA (8:00)	3	96.7 dB
Mntime	3	3/9/2016 10:54:11 PM	Mxtime	3	3/9/2016 11:24:19 PM
PKtime	3	3/10/2016 1:18:03 AM	Lasmx	3	109.5 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	76.3 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	132.1 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080202_20160311_157310
Comments	
Start Time	3/11/2016 10:01:08 PM
Stop Time	3/12/2016 3:07:16 AM
Run Time	05:06:08
Model Type	Edge eg-5
Serial Number	ESN080202
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	86.8 %	Pdose (8:00)	1	220.7 %
Lavg	1	95.7 dB	Leq	1	--
TWA	1	88.9 dB	UL Time	1	00:00:00
SEL	1	163 dB	ProjectedTWA (8:00)	1	95.7 dB
Mntime	1	3/11/2016 10:20:23 PM	Mxtime	1	3/12/2016 2:16:39 AM
PKtime	1	3/11/2016 11:19:38 PM	Lasmx	1	105.5 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	61 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	150 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	82.9 %	Pdose (8:00)	2	210.8 %
Lavg	2	95.3 dB	Leq	2	--
TWA	2	88.6 dB	UL Time	2	00:00:00
SEL	2	162.7 dB	ProjectedTWA (8:00)	2	95.3 dB
Mntime	2	3/11/2016 10:20:23 PM	Mxtime	2	3/12/2016 2:16:39 AM
PKtime	2	3/11/2016 11:19:38 PM	Lasmx	2	105.5 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	61 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	150 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	185.6 %	Pdose (8:00)	3	471.8 %
Lavg	3	96.7 dB	Leq	3	--
TWA	3	92.6 dB	UL Time	3	00:00:00
SEL	3	137.2 dB	ProjectedTWA (8:00)	3	96.7 dB
Mntime	3	3/11/2016 10:20:23 PM	Mxtime	3	3/12/2016 2:16:39 AM
PKtime	3	3/11/2016 11:19:38 PM	Lasmx	3	105.5 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	61 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	150 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080203_20160227_161754
Comments	
Start Time	2/27/2016 10:01:59 PM
Stop Time	2/28/2016 3:02:57 AM
Run Time	05:00:58
Model Type	Edge eg-5
Serial Number	ESN080203
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	51.8 %	Pdose (8:00)	1	109.3 %
Lavg	1	90.6 dB	Leq	1	--
TWA	1	85.2 dB	UL Time	1	00:00:00
SEL	1	159.3 dB	ProjectedTWA (8:00)	1	90.6 dB
Mntime	1	2/28/2016 1:45:47 AM	Mxtime	1	2/27/2016 10:49:04 PM
PKtime	1	2/28/2016 1:48:26 AM	Lasmx	1	103.4 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	63.1 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	130 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	41 %	Pdose (8:00)	2	86.5 %
Lavg	2	88.9 dB	Leq	2	--
TWA	2	83.5 dB	UL Time	2	00:00:00
SEL	2	157.6 dB	ProjectedTWA (8:00)	2	88.9 dB
Mntime	2	2/28/2016 1:45:47 AM	Mxtime	2	2/27/2016 10:49:04 PM
PKtime	2	2/28/2016 1:48:26 AM	Lasmx	2	103.4 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	63.1 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	130 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	66.8 %	Pdose (8:00)	3	141 %
Lavg	3	91.4 dB	Leq	3	--
TWA	3	88.2 dB	UL Time	3	00:00:00
SEL	3	132.8 dB	ProjectedTWA (8:00)	3	91.4 dB
Mntime	3	2/28/2016 1:45:47 AM	Mxtime	3	2/27/2016 10:49:04 PM
PKtime	3	2/28/2016 1:48:26 AM	Lasmx	3	103.4 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	63.1 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	130 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080203_20160302_164849
Comments	
Start Time	3/2/2016 10:01:39 PM
Stop Time	3/3/2016 3:04:21 AM
Run Time	05:02:42
Model Type	Edge eg-5
Serial Number	ESN080203
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	70.8 %	Pdose (8:00)	1	146.7 %
Lavg	1	92.7 dB	Leq	1	--
TWA	1	87.5 dB	UL Time	1	00:00:00
SEL	1	161.5 dB	ProjectedTWA (8:00)	1	92.7 dB
Mntime	1	3/3/2016 2:02:21 AM	Mxtime	1	3/3/2016 12:20:05 AM
PKtime	1	3/3/2016 2:02:58 AM	Lasmx	1	104.8 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	63.2 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	129.1 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	64.5 %	Pdose (8:00)	2	133.6 %
Lavg	2	92 dB	Leq	2	--
TWA	2	86.8 dB	UL Time	2	00:00:00
SEL	2	160.9 dB	ProjectedTWA (8:00)	2	92 dB
Mntime	2	3/3/2016 2:02:21 AM	Mxtime	2	3/3/2016 12:20:05 AM
PKtime	2	3/3/2016 2:02:58 AM	Lasmx	2	104.8 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	63.2 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	129.1 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	109.9 %	Pdose (8:00)	3	227.6 %
Lavg	3	93.5 dB	Leq	3	--
TWA	3	90.4 dB	UL Time	3	00:00:00
SEL	3	134.9 dB	ProjectedTWA (8:00)	3	93.5 dB
Mntime	3	3/3/2016 2:02:21 AM	Mxtime	3	3/3/2016 12:20:05 AM
PKtime	3	3/3/2016 2:02:58 AM	Lasmx	3	104.8 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	63.2 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	129.1 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080203_20160304_165331
Comments	
Start Time	3/4/2016 10:00:46 PM
Stop Time	3/5/2016 3:03:49 AM
Run Time	05:03:03
Model Type	Edge eg-S
Serial Number	ESN080203
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	56.9 %	Pdose (8:00)	1	108.6 %
Lavg	1	90.6 dB	Leq	1	--
TWA	1	85.9 dB	UL Time	1	00:00:00
SEL	1	160 dB	ProjectedTWA (8:00)	1	90.6 dB
Mntime	1	3/4/2016 10:36:29 PM	Mxtime	1	3/5/2016 1:21:41 AM
PKtime	1	3/5/2016 2:02:45 AM	Lasmx	1	101.1 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	63.1 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	134.5 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	49.6 %	Pdose (8:00)	2	94.8 %
Lavg	2	89.6 dB	Leq	2	--
TWA	2	84.9 dB	UL Time	2	00:00:00
SEL	2	159 dB	ProjectedTWA (8:00)	2	89.6 dB
Mntime	2	3/4/2016 10:36:29 PM	Mxtime	2	3/5/2016 1:21:41 AM
PKtime	2	3/5/2016 2:02:45 AM	Lasmx	2	101.1 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	63.1 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	134.5 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	77.8 %	Pdose (8:00)	3	148.7 %
Lavg	3	91.7 dB	Leq	3	--
TWA	3	88.9 dB	UL Time	3	00:00:00
SEL	3	133.5 dB	ProjectedTWA (8:00)	3	91.7 dB
Mntime	3	3/4/2016 10:36:29 PM	Mxtime	3	3/5/2016 1:21:41 AM
PKtime	3	3/5/2016 2:02:45 AM	Lasmx	3	101.1 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	63.1 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	134.5 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080203_20160305_165540
Comments	
Start Time	3/5/2016 10:04:49 PM
Stop Time	3/6/2016 3:05:51 AM
Run Time	05:01:02
Model Type	Edge eg-5
Serial Number	ESN080203
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	37.2 %	Pdose (8:00)	1	65.9 %
Lavg	1	86.9 dB	Leq	1	--
TWA	1	82.8 dB	UL Time	1	00:00:00
SEL	1	156.9 dB	ProjectedTWA (8:00)	1	86.9 dB
Mntime	1	3/5/2016 10:37:55 PM	Mxtime	1	3/5/2016 11:16:02 PM
PKtime	1	3/5/2016 11:26:24 PM	Lasmx	1	102.7 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	69.9 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	128.4 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	12.6 %	Pdose (8:00)	2	22.3 %
Lavg	2	79.1 dB	Leq	2	--
TWA	2	75 dB	UL Time	2	00:00:00
SEL	2	149.1 dB	ProjectedTWA (8:00)	2	79.1 dB
Mntime	2	3/5/2016 10:37:55 PM	Mxtime	2	3/5/2016 11:16:02 PM
PKtime	2	3/5/2016 11:26:24 PM	Lasmx	2	102.7 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	69.9 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	128.4 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	35.2 %	Pdose (8:00)	3	62.3 %
Lavg	3	87.9 dB	Leq	3	--
TWA	3	85.4 dB	UL Time	3	00:00:00
SEL	3	130 dB	ProjectedTWA (8:00)	3	87.9 dB
Mntime	3	3/5/2016 10:37:55 PM	Mxtime	3	3/5/2016 11:16:02 PM
PKtime	3	3/5/2016 11:26:24 PM	Lasmx	3	102.7 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	69.9 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	128.4 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080203_20160309_165804
Comments	
Start Time	3/9/2016 10:02:07 PM
Stop Time	3/10/2016 3:03:18 AM
Run Time	05:01:11
Model Type	Edge eg-5
Serial Number	ESN080203
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	97.4 %	Pdose (8:00)	1	184.4 %
Lavg	1	94.4 dB	Leq	1	--
TWA	1	89.8 dB	UL Time	1	00:00:00
SEL	1	163.8 dB	ProjectedTWA (8:00)	1	94.4 dB
Mntime	1	3/9/2016 10:55:02 PM	Mxtime	1	3/10/2016 12:02:23 AM
PKtime	1	3/10/2016 12:02:16 AM	Lasmx	1	107 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	73.2 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	115.5 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	96.6 %	Pdose (8:00)	2	183 %
Lavg	2	94.3 dB	Leq	2	--
TWA	2	89.7 dB	UL Time	2	00:00:00
SEL	2	163.8 dB	ProjectedTWA (8:00)	2	94.3 dB
Mntime	2	3/9/2016 10:55:02 PM	Mxtime	2	3/10/2016 12:02:23 AM
PKtime	2	3/10/2016 12:02:16 AM	Lasmx	2	107 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	73.2 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	115.5 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	151.7 %	Pdose (8:00)	3	287.4 %
Lavg	3	94.5 dB	Leq	3	--
TWA	3	91.8 dB	UL Time	3	00:00:00
SEL	3	136.4 dB	ProjectedTWA (8:00)	3	94.5 dB
Mntime	3	3/9/2016 10:55:02 PM	Mxtime	3	3/10/2016 12:02:23 AM
PKtime	3	3/10/2016 12:02:16 AM	Lasmx	3	107 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	73.2 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	115.5 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			

Session Report

3/29/2016

General Information

Name	ESN080203_20160311_167318
Comments	
Start Time	3/11/2016 10:05:08 PM
Stop Time	3/12/2016 3:05:42 AM
Run Time	05:00:34
Model Type	Edge eg-5
Serial Number	ESN080203
Device Firmware Rev	R.22C
CompanyName	
Description	
Location	
User Name	

Summary Data

Description	Meter	Value	Description	Meter	Value
Dose	1	53.7 %	Pdose (8:00)	1	136.1 %
Lavg	1	92.2 dB	Leq	1	--
TWA	1	85.5 dB	UL Time	1	00:00:00
SEL	1	159.5 dB	ProjectedTWA (8:00)	1	92.2 dB
Mntime	1	3/11/2016 10:30:21 PM	Mxtime	1	3/12/2016 12:39:58 AM
PKtime	1	3/12/2016 10:43:36 PM	Lasmx	1	102.7 dB
Lafmx	1	--	Lcsmx	1	--
Lcfmx	1	--	Lasmn	1	63.1 dB
Lafmn	1	--	Lcsmn	1	--
Lcfmn	1	--	Lcpk	1	--
Lzpk	1	133.9 dB	Lapk	1	--
Weighting	1	A	RangeCeiling	1	140 dB
Criterion Level	1	90 dB	ULL	1	115 dB
Dynamic Range	1	80 dB	Exchange Rate	1	5 dB
Response	1	SLOW	Integrating Threshold	1	80 dB
Alarm Level 1	1	--	AlarmLevel2	1	--

Dosimeter Name	1	OSHA HC			
Dose	2	44.8 %	Pdose (8:00)	2	113.5 %
Lavg	2	90.9 dB	Leq	2	--
TWA	2	84.2 dB	UL Time	2	00:00:00
SEL	2	158.2 dB	ProjectedTWA (8:00)	2	90.9 dB
Mntime	2	3/11/2016 10:30:21 PM	Mxtime	2	3/12/2016 12:39:58 AM
PKtime	2	3/12/2016 10:43:36 PM	Lasmx	2	102.7 dB
Lafmx	2	--	Lcsmx	2	--
Lcfmx	2	--	Lasmn	2	63.1 dB
Lafmn	2	--	Lcsmn	2	--
Lcfmn	2	--	Lcpk	2	--
Lzpk	2	133.9 dB	Lapk	2	--
Weighting	2	A	Range Ceiling	2	--
Criterion Level	2	90 dB	ULL	2	115 dB
Dynamic Range	2	--	Exchange Rate	2	5 dB
Response	2	SLOW	Integrating Threshold	2	90 dB
Alarm Level 1	2	--	AlarmLevel2	2	--
Dosimeter Name	2	OSHA PEL			
Dose	3	82 %	Pdose (8:00)	3	207.9 %
Lavg	3	93.1 dB	Leq	3	--
TWA	3	89.1 dB	UL Time	3	00:00:00
SEL	3	133.7 dB	ProjectedTWA (8:00)	3	93.1 dB
Mntime	3	3/11/2016 10:30:21 PM	Mxtime	3	3/12/2016 12:39:58 AM
PKtime	3	3/12/2016 10:43:36 PM	Lasmx	3	102.7 dB
Lafmx	3	--	Lcsmx	3	--
Lcfmx	3	--	Lasmn	3	63.1 dB
Lafmn	3	--	Lcsmn	3	--
Lcfmn	3	--	Lcpk	3	--
Lzpk	3	133.9 dB	Lapk	3	--
Weighting	3	A	Range Ceiling	3	--
Criterion Level	3	90 dB	ULL	3	115 dB
Dynamic Range	3	--	Exchange Rate	3	3 dB
Response	3	SLOW	Integrating Threshold	3	80 dB
Alarm Level 1	3	--	AlarmLevel2	3	--
Dosimeter Name	3	ACGIH			