Hearing Conservation Program

THE NATION'S URANIUM PROCESSING FACILITY

Preparer:		12/12/24
	Nicholas A. Prewitt BNI UPF Industrial Hygienist	Date
Approval		12/16/24
	Robert C. Drake BNI UPF ES&H Manager	Date
		12/16/24
	Gary J. Cough UPF Site Manager	Date
		01/16/25 ~~12/17/24~~ Initials: MS Date: 12/18/24
		Effective Date

Pen & Ink for Minor Correction (Non-Intent) in accordance with Y15-95-800

Page Numbers Affected: Page 1

Reason for Change:
Updated effective date due to pending effective training

O&AS Document Services will ensure the Pen & Ink change is documented as a Pending Update and will be included in the next revision, if appropriate.

Signatures below confirm the changes made are deemed Non-Intent (Minor Changes) only.

Mikella Seymour — 12/18/24
Requestor – Printed Name/Signature — Date

Shannon Shepherd — 12/18/24
Approver – Printed Name/Signature (RM/FDC for Document) — Date

RC-UPF DMC
12/17/24 07:30

This document has been reviewed by a Y-12 DC/ RO and has been determined to be UNCLASSIFIED, not UCNI, and contains no CUI based upon current classification guidance. This review does not constitute a review for CUI outside of classification guidance and does not constitute clearance for Public Release.
Name: Gina M. Nelson Date: 12/16/24

REVISION LOG

Revision 5
☒ Intent ☐ Non-Intent Implements PRMS Requirements: ☒ Yes ☐ No

• These changes are in response to Action 01 of Condition Report 25774-000-GCA-GAM-04903, *Revise UPF-CP-312 to improve the overall quality of the document*
• This revision incorporates the changes identified in and supersedes PRCN-UPF-CP-312-R04-01
• Updated to current command media template
• Updated STARRT to FLHA throughout document
• Updated Section 1.2, *Scope*, to clarify Subcontractor relationship and requirements
• Updated section 4.0, *Audiometric Testing,* to add direction for obtaining Noise Dosimetry to assist in determining the work-relatedness of any reported Standard Threshold Shifts
• Updated Section 5.0, *Records*
• Removed associated forms from Attachments
• No forms have been edited as part of this revision
• Other changes include:
  ○ Updated references and acronyms
  ○ Editorial changes

Revision 4
☒ Intent ☐ Non-Intent Implements PRMS Requirements: ☒ Yes ☐ No
• This revision replaces the previous revision in its entirety; therefore, no revision bars are shown. This revision further establishes guidance for the protection of personnel from hearing loss induced by workplace noise during construction activities.
Previous revisions on record

CONTENTS

TABLES

1.0 INTRODUCTION

1.1 Purpose

This procedure describes the processes to be implemented at the Uranium Processing Facility (UPF) construction site and support areas for worker protection against hearing loss due to exposure to noise during construction activities. This procedure establishes the written hearing conservation program (HCP) for the UPF project.

1.2 Scope

This procedure applies to all personnel who are assigned to work at locations within the UPF construction site and/or support areas where the potential for exposure to high levels of workplace noise exists. The procedure applies to direct hire (craft and nonmanual) personnel who are exposed to noise levels at or above the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) – time weighted average (TWA). Subcontractors shall comply with the requirements of this procedure as described in *Appendix B-1* of their respective contracts.

2.0 RESPONSIBILITIES

2.1 Site Manager

The Site Manager has the overall responsibility for ensuring the effective implementation of this procedure.

The Site Manager is responsible for:

- Ensuring all applicable construction project personnel exposed to noise levels at or above the ACGIH TLV–TWA actively participate in the HCP
- Providing worker support, facilities, and other resources necessary to effectively carry out the HCP

2.2 Project Industrial Hygienist

In conjunction with the Site Manager, the Project Industrial Hygienist (PIH) is responsible for implementing and administering this procedure. The overall authority to interpret this procedure rests with the PIH, and includes the authority to interpret the intent and applicability of this procedure, as well as, all requirements referenced in or associated with this procedure. The PIH or designee shall ensure the following:

- Exposure assessments are performed by Environment, Safety and Health (ES&H) personnel with calibrated sound-level meters, dosimeters, and other measuring instruments
- An effective personal protective equipment (PPE) program is in place to ensure employees wear required hearing protection PPE (e.g., earmuffs and/or earplugs) in work areas where noise levels are at or above the ACGIH TLV–TWA and hearing protection PPE has been properly evaluated and accepted for the work environment

- Engineering controls are evaluated and implemented for tasks potentially exposing workers to noise levels equal to or greater than the ACGIH TLV–TWA
- A hearing conservation training program adapted to conditions specific to the UPF construction site and support areas is developed
- A noise monitoring strategy is implemented to ensure noise monitoring is conducted and documented. (See **Section 3.3.1, *Noise Monitoring Strategy***)

2.3 Environment, Safety and Health Representative

The ES&H Representative has the responsibility for implementing HCP requirements in accordance with this procedure.

The ES&H Representative is responsible for:

- Conducting periodic field inspections
- Providing technical advice and interpretation of worker safety and health requirements included in this procedure
- Coordinating and communicating with the Project ES&H Manager or designee about noise monitoring activities
- Ensuring noise monitoring equipment is in good operating condition and it has the current calibration date
- Operating noise monitoring equipment in accordance with the manufacturer's guidance
- Performing pre and post monitoring noise instrument calibration checks, as required
- Advising field construction workers when they need to be wearing hearing protection PPE and how to wear it correctly
- Helping communicate noise related hazard information to employees, e.g., assist with posting warning signs in areas where hearing protection is required
- Documenting noise monitoring activities
- Communicating the data obtained from personal noise level monitoring to personnel

2.4 Construction Supervision

Construction supervision is responsible for having a thorough understanding of individual responsibilities regarding compliance with and implementation of this procedure, which may include the following:

- Coordinate with the PIH or designee and the ES&H Representative or designee to ensure noise levels are monitored and warning signs are posted in accordance with the requirement of the HCP
- Ensure within their areas of responsibility that the applicable safety controls and processes are incorporated into planning and execution of the work and the workers are implementing and complying with this procedure
- Ensure work areas and tasks under their responsibility have been assessed for noise and that locations with high noise levels are posted in compliance with this procedure

- Ensure controls (e.g., engineering controls, administrative controls, PPE) have been assessed for their work areas and tasks and are implemented for reducing or eliminating the worker exposure to noise
- Identify and report to PIH or CNS ES&H Representative all employees who are or will be potentially affected by the requirements of this procedure
- Identify employees who may be exposed to noise levels at or above an 8-hour TWA of 85 decibels, A scale (dBA) (or a dose of 100 percent)
- Ensure employees who are exposed to noise levels at or above an 8-hour TWA of 85 dBA (or a 100 percent dose) have been trained
- Ensure employees are wearing hearing protection devices in posted or designated noise areas and wearing them correctly
- Enforce the requirements of this procedure

2.5 Occupational Medical Provider(s)

The occupational medical provider is responsible for the following:

- Conduct baseline and annual audiograms for project workers enrolled in the HCP
- Evaluate workers when referred by the PIH
- Determine whether any of the workers enrolled in the HCP have experienced a standard threshold shift (STS)
- Notify the worker and the PIH when an STS has occurred

It is the responsibility of Bechtel National Inc. and subcontractors to have their own occupational medical providers. The PIH will coordinate with the Y-12 National Security Complex (Y-12) Occupational Health Services for designated project employees who are allowed to use services provided by Consolidated Nuclear Security, LLC (CNS) on site medical staff (e.g., CNS craft) as described in ICD-PM-801768-A011, *Appendix N, Interface Control Document (ICD) for CNS ES&H*. Subcontractors will be responsible for procuring occupational medical services for their employees who are required by the HCP to receive baseline and annual audiograms.

2.6 Workers

Workers are responsible for complying with the requirements of the HCP, including the following:

- Wear required hearing protection PPE (e.g., earmuffs and/or earplugs)
- Wear noise dosimeter devices, as assigned by PIH or ES&H Representative
- Follow HCP required safety postings
- Attend or participate in HCP training or other requirements (e.g., audiograms)

3.0 OCCUPATIONAL NOISE EXPOSURE PREVENTION AND CONTROL

3.1 Process Description

The UPF project will implement controls prescribed in this HCP when noise monitoring results indicate personnel exposure levels exceed the values shown in **Table 1, *Occupational Noise Exposure Limits***.

Table 1. Occupational Noise Exposure Limits

Duration per Day	Sound Level (dBA)
16 hours	82
8 hours	85
4 hours	88
2 hours	91
1 hour	94
30 minutes	97
15 minutes	100
7.5 minutes	103
3.75 minutes	106
1.88 minutes	109
0.94 minute	112
Not allowed	>115

3.2 Hearing Conservation Program

This HCP is designed to prevent noise induced occupational hearing loss. The program is intended to identify areas or activities within the jobsite where personnel noise exposures may equal or exceed an 8-hour TWA of 85 dBA or a dose of 100 percent.

Use of the hierarchy of controls to protect employees from hearing loss will occur in the following order of precedence: elimination, substitution, engineering controls, administrative controls, and PPE.

Finally, the program monitors workers assigned to HCP-designated areas or exposure groups to measure and verify workers are protected through:

- A baseline and annual audiogram
- Additional audiograms as required by authorized occupational medical providers

3.3 Hazard Assessment Review and Planning

Noise hazards will be assessed as part of the work planning process via Job Hazard Analysis (JHA). In addition, workers will review noise hazards and hazard controls at the work location daily (or more frequently as appropriate) via the Field Level Hazard

Assessment (FLHA) process. Any known tasks or activities with the potential to expose workers to noise levels at or above the ACGIH TLV–TWA should be identified and documented in the JHA and on UCN-23552, *Field Level Hazard Assessment (FLHA) Card*. For more information, refer to Y17-95-64-823, *UPF Field Level Hazard Assessment/Job Hazard Analysis Program (FLHA/JHA) Process*.

The PIH may use existing noise data, such as those available from Y-12 Industrial Hygiene, Occupational Health Services, or those maintained in the Bechtel Industrial Hygiene Records System to identify tasks that potentially expose worker groups to noise levels exceeding the ACGIH TLV–TWA.

The PIH or designee is responsible for evaluating the need for engineering controls and other controls for hearing protection. The PIH or designee makes recommendations based on the evaluation as to what controls should be implemented for protecting workers from occupational hearing loss.

3.3.1 Noise-Monitoring Strategy

Under the direction of the PIH or designee, ES&H personnel will conduct noise level monitoring. Noise monitoring shall be performed by personnel who are knowledgeable in the implementation of noise monitoring strategies, noise monitoring instruments, occupational noise exposure standards, and the requirements of this procedure.

To record noise measurements, ES&H personnel use UCN-26521, *Noise Monitoring Form*, or the equivalent, as determined by the PIH.

Employees exposed at or above the ACGIH TLV–TWA will be notified of the results of the monitoring. Affected employees will be notified either verbally or in writing within two working days. To notify affected employees in writing, use UCN-26522, *Employee Notification Form*, or the equivalent, as determined by the PIH.

3.3.2 Observation of Monitoring

Employees or their representatives shall have the opportunity to observe noise measurements when they are directly affected by the measurements taken. The PIH or ES&H Representative shall inform workers or their representatives when noise measurements will occur.

3.3.3 Sound Survey Request

Personnel may request the PIH or designee conduct a sound survey when they believe there is a source, area, or task that potentially exposes them to hazardous noise levels. To make such a request, the employee must first contact their supervisor. The supervisor will forward the request to the PIH. The PIH will consider the request and determine whether the request should be prioritized relative to other survey requests or activities.

3.4 Noise Prevention Methods

The prevention of exposure to unacceptable occupational noise levels shall occur in the following order of precedence: elimination, substitution, engineering controls, administrative controls, and PPE. These noise control methods are discussed in **Section 3.4.1*, Elimination, Substitution, and Engineering Controls*** through

Section 3.4.3, *Personal Protective Equipment*. Section 3.4.4, *Selection and Attenuation* discusses how hearing protection devices are selected.

3.4.1 Elimination, Substitution, and Engineering Controls

The first line of defense against noise exposure is elimination. If a noise source can be eliminated and the work can still be performed, that should be the first consideration.

The second line of defense is substitution. If a tool or a piece of equipment producing less noise is available for substitution, it should be considered for use (in line with the Buy Quiet initiatives led by the National Institute for Occupational Safety and Health [NIOSH]).

The third line of defense is engineering controls. Specific controls may include the following:

- Replace or modify noisy equipment
  - Use equipment with noise reduction controls
  - Retrofit equipment with a device providing for low noise output or local noise attenuation
- Erect a suitable sound barrier (e.g., sound wall or curtain) to isolate employees from the noise source
- Install vibration dampeners
- Install mufflers

3.4.2 Administrative Controls

The fourth line of defense against noise exposure is administrative controls. Specific administrative controls may include the following:

- Develop and implement a regular maintenance schedule to ensure proper operation of tools and equipment, including equipment installed for noise attenuation.
- Increase the distance between noise-producing equipment and employees
- Limit personnel access, when feasible, to noisy areas
- Limit the amount of time workers are exposed to noise (e.g., shut down noisy equipment when it is not needed)
- Post signs and/or erect barricades to prohibit unauthorized personnel access to noisy areas, in accordance with UPF-CP-214, *Barricades and Signs*
- Administer the HCP, including monitoring the use of personal hearing protection devices by workers at risk of excessive noise exposure

When a noise source is identified that puts workers at risk of overexposure, its location, as well as any associated requirements and measures for exposure control, shall be communicated clearly to workers. The hazard can be effectively communicated by the use of one or more of the following methods: mark the area with danger or caution signs (or tapes), mark the equipment (source) with a noise label (affixed to a position that is level with or readily visible from the operator's work position), pre job briefing, JHA, FLHA, and other approved methods of hazard communication. This requirement does not apply to alarm systems, public address

systems, or other sources of intermittent noise exposure that would not equal or exceed the ACGIH TLV–TWA.

3.4.3 Personal Protective Equipment

Hearing protection devices (PPE) shall be made available to all employees exposed to noise levels at or above the ACGIH TLV–TWA at no cost to the employees. All employees who may be exposed to noise levels at or above an 8-hour TWA of 85 dBA are required to wear hearing protection devices. Double hearing protection (i.e., earplugs covered by earmuffs) is required when noise levels equal or exceed an 8-hour TWA of 100 dBA.

In general, earmuffs and banded or corded earplugs are recommended when one needs to wear hearing protection for only a short time (e.g., walking through or briefly entering a posted noise area).

Workers must wear hearing protection devices when any of the following situations or conditions applies:

- Waiting for a sound level survey to be completed
- Performing a task whose work documents (e.g., JHA, FLHA) and/or this program require workers wear hearing protection
- Working in or passing through posted noise hazard locations as specified by the area postings or signs
- Using tools designated as high noise equipment. Refer to ML-SH-801768-A011, *Sound Levels of Common Construction Power Tools* for additional information

Additionally, as a best practice, workers should consider wearing hearing protection when circumstances such as those listed below exist:

- A voice has to be raised above a normal level to be heard 3 feet away
- The perceived noise level is above that of a crowded bar or restaurant

3.4.4 Selection and Attenuation

3.4.4.1 Selection

The PIH or designee and Construction Supervisor or designees are responsible for selecting appropriate hearing protection devices for workers using the two-step process described in this section. Because the device's noise reduction rating (NRR) represents its ability to reduce noise under ideal laboratory conditions, the PIH or designee uses suitable correction factors to account for known differences between the device's laboratory-derived attenuation values and the protection actually obtained in the workplace.

The PIH or designee selects an appropriate hearing protection device using the below listed two-step method:

1. Determine the employee's representative noise exposure.
2. Determine the recommended NRR per **Table 2, *Recommended Noise Reduction Ratings***.

3.4.4.2 Hearing Protection Usage

The amount of protection (attenuation) provided by a hearing protector in actual field use has been shown to be lower when the protector is not used properly or a comfortable noise blocking seal is not maintained during the entire noise exposure. Use **Table 2** to assist in the selection of appropriate hearing protection.

Table 2. Recommended Noise Reduction Ratings

Noise Exposure (8-hour TWA)	Recommended NRR[1, 2]
85–89 dBA 90–92 dBA 93–95 dBA	20 or Higher 25 or Higher 29 or Higher
96–114 dBA	Contact the Project Industrial Hygienist for hearing protection evaluation.

[1] The NRR is a U.S. Environmental Protection Agency (EPA) labeling guide of noise reduction (in decibels [dB]) determined by laboratory test measurements in accordance with American National Standards Institute (ANSI) S3.19 1974, American National Standard for the Measurement of Real Ear Hearing Protectors and Physical Attenuation of Earmuffs (Title 40 of the Code of Federal Regulations [CFR], Part 211, "*Product Noise Labeling*").

[2] As described in Occupational Safety and Health Administration (OSHA) Technical Manual, OSHA Instruction TED 01-11-015 (TED 1-0.15A), Section III, Chapter 5, the relative effectiveness of a hearing protector can be estimated by the application of a 50 percent safety factor to the laboratory based NRR. For A weighted measurements, subtract 7 dB from the NRR and multiply by 50 percent: (NRR – 7 dB) × 50%. For example, when a worker wearing earplugs or earmuffs with an NRR of 29 dB is exposed to 95 dBA for 8 hours, the worker's resultant exposure is estimated to be 95 dBA – [(29 dB – 7 dB) × 50%] = 84 dBA. To estimate the relative effectiveness of a hearing protector for C weighted measurements, multiply the NRR by 50 percent. The 50-percent safety factor will be used to determine when to implement additional controls. For compliance purposes, the NRR will only be reduced by 7.

3.4.4.3 Other Selection Methods

The PIH or designee may recommend hearing protection devices using methods other than the method described above. Alternative NRR adjustment methods include Method B of ANSI S12.6-1997, *Methods for Measuring the Real Ear Attenuation of Hearing Protectors*, the OSHA method for C weighted measurements described in Appendix B to 29 CFR 1910.95 *Methods for Estimating the Adequacy of Hearing Protector Attenuation*, or the NIOSH recommendation for derating the NRR by a multiplicative factor of 75, 50, and 30 percent for earmuffs, slow-recovery formable earplugs, and all other earplugs, respectively.

3.4.4.4 Overprotection

Selecting the highest level of hearing protection is not always best. Overprotection can interfere with the perception of speech or warning signals; in intermittent noise conditions, it can be significant and a potential safety hazard when it prevents workers from hearing warning sounds. High levels of noise can drown out warning signals, and the use of hearing protectors may, in some situations, further compound the problem. Construction Supervision and the PIH should review the potential risks of overprotection and ensure the use of hearing protection will not diminish an employee's ability to hear critical warning signals.

4.0 AUDIOMETRIC TESTING

All personnel who are exposed to occupational noise levels at or above the ACGIH TLV–TWA shall receive baseline and annual audiograms. They shall receive a

baseline audiogram as part of their employment physical examinations or within six months of initial exposure. As stated in **Section 2.5, *Occupational Medical Provider(s),*** subcontractors are required to have their own occupational medical providers perform baseline and annual audiograms for their employees.

NOTE: *Exposure to noise sources (on and off the job) should be avoided for at least 14 hours before the audiogram.*

If a comparison between an employee's annual audiogram results and baseline results shows the employee has experienced an STS, the employee will be informed of the results of the audiometric testing in accordance with Y73-203, *Occupational Noise Exposure and Hearing Conservation Program*. The affected employee must be fitted or refitted with hearing protectors capable of attenuating the employee exposure to an 8-hour TWA of 85 dBA or below.

BNI ES&H will perform personal noise dosimetry to get a representative sample(s) to assist in determining the work-relatedness.

5.0 RECORDS

Records generated by this Document shall be maintained in accordance with Y15-95-800, *UPF Document Management*.

The following records are generated:

Record or Form Number	Record Title	System/ Location	Document Type
UCN-26521	*Noise Monitoring Form*	InfoWorks	RP
UCN-26522	*Employee Notification Form*	InfoWorks	RP

6.0 REFERENCES

6.1 Source References

29 CFR 1910.95, *Occupational Noise Exposure*

29 CFR 1926.52, *Occupational Noise Exposure*

29 CFR 1926.101, *Hearing Protection*

40 CFR 211, *Product Noise Labeling*

ANSI S3.19 1974, *American National Standard for the Measurement of Real-Ear Hearing Protectors and Physical Attenuation of Earmuffs*

OSHA Technical Manual, *OSHA Instruction TED 01-00-015 (TED 1-0.15A), Section III, Health Hazards, Chapter 5, Noise*

6.2 Interfacing References

29 CFR 1910.95 *Methods for Estimating the Adequacy of Hearing Protector Attenuation, Appendix B*

ANSI S12.6-1997, *Methods for Measuring the Real Ear Attenuation of Hearing Protectors, Method B*

ICD-PM-801768-A011, *Appendix N, Interface Control Document for CNS ES&H*

ML-SH 801768 A005, *Hearing Protection List*

ML-SH-801768-A011, *Sound Levels of Common Construction Power Tools*

UPF-CP-214, *Barricades and Signs*

Y15-95-800, *UPF Document Management*

Y17-95-64-823, *UPF Field Level Hazard Assessment/Job Hazard Analysis (FLHA/JHA) Process*

Y73-203, *Occupational Noise Exposure and Hearing Conservation Program*

6.3 Forms

UCN-23552*, Field Level Hazard Assessment (FLHA) Card*

UCN-26521*, Noise Monitoring Form.*

UCN-26522*, Employee Notification Form*

7.0 SUPPLEMENTAL INFORMATION

Appendix A, *Acronyms and Definitions*

APPENDIX A
Acronyms and Definitions

(Page 1 of 3)

Acronyms

ACGIH - American Conference of Governmental Industrial Hygienists 4
CNS - Consolidated Nuclear Security, LLC 6
dB - Decibel 11
dBA - Decibel, A Scale 6
ES&H - Environmental Safety and Health 4
FLHA - Field Level Hazard Assessment 7
HCP - Hearing Conservation Program 4
Hz - Hertz 16
ICD - Interface Control Document 6
JHA - Job Hazard Analysis 7
NIOSH - National Institute for Occupational Safety and Health 9
NRR - Noise Reduction Rating 10
OEL - Occupational Exposure Level 16
OSHA - Occupational Safety and Health Administration 11
PIH - Project Industrial Hygienist 4
PPE - Personal Protective Equipment 4
STS - Stand Threshold Shift 6
TLV - Threshold Limit Value 4
TWA - Time Weighted Average 4
UPF - Uranium Processing Facility 4
Y-12 - Y-12 National Security Complex 6

Definitions

Attenuation	The reduction of noise achieved by physical barriers, mufflers, personal hearing protection devices, distance, etc.
Audiogram	A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.
A-Weighted Scale	A scale incorporated in sound level instruments that most approximates the response of the human ear to various sound frequencies.
Baseline Audiogram	The initial or revised baseline audiogram against which subsequent audiograms are compared.
Continuous Sound	Sound intervals no greater than 1 second apart.
Criterion Level	The sound level at which noise dosimeters are set so that this decibel (dB) level equals a 100 percent dose over 8 hours; 85 dB is used for a criterion level of 100 percent set for the ACGIH (TLV).

APPENDIX A
Acronyms and Definitions

(Page 2 of 3)

Decibel (dB)	A unit of measurement of sound level based on a ratio expressing how much greater a sound is above a specified reference of 0.00002 newton's per square meter. Sound levels are measured on a manageable, compressed logarithmic decibel scale pertaining to human hearing. The decibel scale is set from 0 dB (the reference sound pressure of 20 micropascals at 1000 hertz [Hz]) to 140 dB (the threshold of pain).
Decibel, A Scale (dBA)	The measure of sound weighted to approximate the ear's response to sound levels at various frequencies. Sounds that are lower in frequency are less damaging to the ear, so their overall contribution to the sound level is discounted.
Dose	Exposure to sound levels expressed as a percentage of the occupational exposure limit (OEL) (defined below). A 100 percent dose requires participation in an HCP.
Double Hearing Protection	Simultaneous wearing of earplugs and earmuffs.
Exchange Rate	The concept that an increase or decrease of 3 dBA in noise level will double or halve the allowable noise dose. For example, a noise increase from 85 to 88 dBA will decrease the allowable exposure time from 8 to 4 hours.
Hearing Loss	A decrease in auditory sensitivity as the result of aging, disease, or injury to the hearing organ system.
Hearing Protection Device, Hearing Protector, or Hearing Protection	Personal protective equipment (PPE) worn to reduce the harmful auditory effects of sound. Examples include earplugs (disposable and reusable) and earmuffs.
Impulse/Impact Sound	A sound burst that is characterized by a sharp rise and rapid decay in sound levels and is greater than 1 second in duration between sound intervals.
Noise	Unwanted sound pressure. The physiological injury caused by working in elevated noise levels is explained as damage to the hair-like nerve follicles located in the cochlea, which transmit hearing sensation from the inner ear to the brain. Repeated and/or prolonged exposure to elevated levels of noise will result in auditory fatigue of these follicles and eventual function failure of the cochlea.
Noise Dosimeter	An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose. All noise dosimeters must be capable of (a) measuring continuous sound levels on the A weighted network using a 3 dBA exchange rate and (b) integrating all continuous, intermittent, and impulse sound levels from 80 to 140 dBA.
Noise Reduction Rating (NRR)	A measurement of the number of dB that a hearing protection device is capable of reducing (attenuating). Research has shown that the manufacturer published NRR overestimates the actual noise reduction achieved when the device is worn in the workplace. Consequently, the manufacturer-published NRR should be adjusted.

APPENDIX A
Acronyms and Definitions

(Page 3 of 3)

Occupational Exposure Limit (OEL)	The exposure levels and allowable exposure periods that are defined in **Table 1** in **Section 3.0**. As defined above, the ACGIH TLV is an 8-hour TWA of 85 dBA (or a dose of 100 percent), and this will be the value used as the OEL for the UPF project.
Personnel Exposure	Exposure to noise without regard to use of hearing protection.
Sound Level Meter	An instrument used to measure instantaneous noise levels. It is typically used for point source measurements of equipment or activities and/or establishment of boundaries. This instrument should not be used to determine 8-hour TWA noise exposures for OEL comparison.
Standard Threshold Shift (STS)	A change in hearing threshold relative to an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. This shift is permanent hearing loss and is an occupational illness. In contrast, a temporary threshold shift is a temporary and reversible hearing loss that occurs following a short-term exposure to excessive noise.
Time-Weighted Average (TWA)	The sound level for an 8-hour exposure period covering a range of 80 to 140 dBA with 85 dBA criterion and 3 dB exchange rate.
Written Hearing Conservation Program (HCP)	A written procedure that identifies specific processes to be implemented to comply with the OSHA requirements for hearing conservation (see, for example, 29 CFR 1910.95, 1926.52, and 1926.101). This document serves as the written HCP for the UPF project.