



Quality Assurance Work Instruction

CP-00-7000-003

Approved:

Date: 11 April 2005

Title: Hearing Conservation

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1.0 POLICY/PURPOSE

SBAR, Inc. ensures that the hearing of all of its employees is properly protected and that instances of hearing loss are avoided to the maximum extent possible. The purpose of this WI is to establish an effective hearing conservation program that is compliant with federal and state OSHA rules and regulations.

2.0 SCOPE

This WI applies to all Santa Barbara Applied Research (SBAR), Inc. operations where hazardous noise is present. Where applicable, SBAR subcontractors also comply with the provisions of this WI.

3.0 REFERENCES AND DEFINITIONS

3.1 References

ISO 9001: Quality Management Systems-Requirements, Third Edition (2000-12-15)

- ISO 9001, 4.2.1(d): Documents
- ISO 9001, 7.5.1: Control of Production and Service Provision

29 CFR 1910.95: Occupational Noise Exposure

T8 CCR 5095-5100: Control of Noise Exposure

National Safety Council, (1988), *Fundamentals of Industrial Hygiene, 3d E., Chapter 9.*

[SBAR Hearing Conservation Training Syllabus WI \(CP-00-7000-003-A\)](#)

3.2 Definitions

Action Level: An 8-hour time-weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.

Audiogram: A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.



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Audiologist: A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing and Language Association or licensed by a state board of examiners.

Baseline Audiogram: The audiogram against which future audiograms are compared.

Decibel (dB): Unit of measurement of sound level.

dBA (Decibels-A-Weighted): A unit of measurement of sound level corrected to the A-weighted scale, as defined in ANSI S1.4-1971 (R1976), using a reference level of 20 micropascals (0.00002 Newton per square meter).

Hazardous Noise Area: Any area or operation where personnel could be exposed to:

- An 8-hour TWA level greater than 85 dBA, continuous or intermittent (non-impact) noise above 115 dBA, or peak sound pressure levels above 140 dBA.
- Impulse or impact noise greater than 140 dBA peak sound pressure level.

Impulse or Impact Noise: A short burst of sound, generally less than one-half second in duration and does not repeat more than once per second.

Medical Pathology: A disorder or disease. For purposes of this work instruction, a condition or disease affecting the ear, which should be treated by a physician specialist.

Noise: Any unwanted sound.

Noise Survey: An examination of a specific noise using a calibrated sound level meter to determine the level (dBA) of noise that is being generated.

Occupational Hearing Loss: A hearing impairment of one or both ears, partial or complete, arises in, or during the course of, but as the result of one's employment.

Otolaryngologist: A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

Representative Exposure: Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employer deems to be representative of exposures of other employees in the workplace.



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Standard Threshold Shift (STS): A change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000 and 4000 Hz in either ear. (**NOTE:** Standard Threshold Shifts are reported on the OSHA Form 300, *Summary of Work-Related Injuries and Illness*.)

Sound Level: Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals. Unit: decibels (dB). For use with this regulation, SLOW time response, in accordance with ANSI S1.4-1971 (R1976), is required.

Sound Level Meter: An instrument for the measurement of sound level.



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4.0 RESPONSIBILITIES

4.1 SBAR Quality Manager

The SBAR Quality Manager is responsible for this WI and revises SBAR *Hearing Conservation Training Syllabus WI (CP-00-7000-003-A)*, as necessary.

4.2 Program Managers

Program Managers ensure hearing conservation requirements are fulfilled on their contracts and when necessary, ensure contract specific WIs are written to supplement this WI.

4.3 Contract/Subcontract Managers

When hazardous noise is present on a contract, Contract/Subcontract Managers ensure subcontractors comply with the applicable requirements of this WI as well as 29 CFR 1910.95 and T8 CCR 5095-5100, as applicable.

4.4 Quality/Safety/Environmental (QSE) Managers

QSE Managers (or equivalent) are responsible for implementing the hearing conservation program for their respective contracts and, as necessary, publish a contract specific WI to supplement this WI. Additionally, QSE is also responsible for information and training materials related to the hearing conservation program. Further, QSE Managers refer to the applicable federal and state OSHA references (e.g., 29 CFR 1910.95, T8 CCR 5095-5100, and appendices) for the details necessary to administer a successful hearing conservation program.

4.5 Managers/Supervisors

Managers and supervisors ensure their operations comply with hearing conservation program requirements. Additionally, managers and supervisors ensure their personnel understand how to properly protect themselves from hazardous noise and that their employees have the proper hearing protective equipment and/or limit employee exposure to hazardous noise. Further, when audiometric testing is scheduled, managers/supervisors ensure employee testing is preceded by at least 14 hours without exposure to noise.

4.6 Employees

Prior to exposure to hazardous noise, employees ensure they understand the risks associated with noise and that they take the proper precautions to eliminate hearing loss. Further, when audiometric testing is scheduled, employees ensure testing is preceded by at least 14 hours without exposure to noise.

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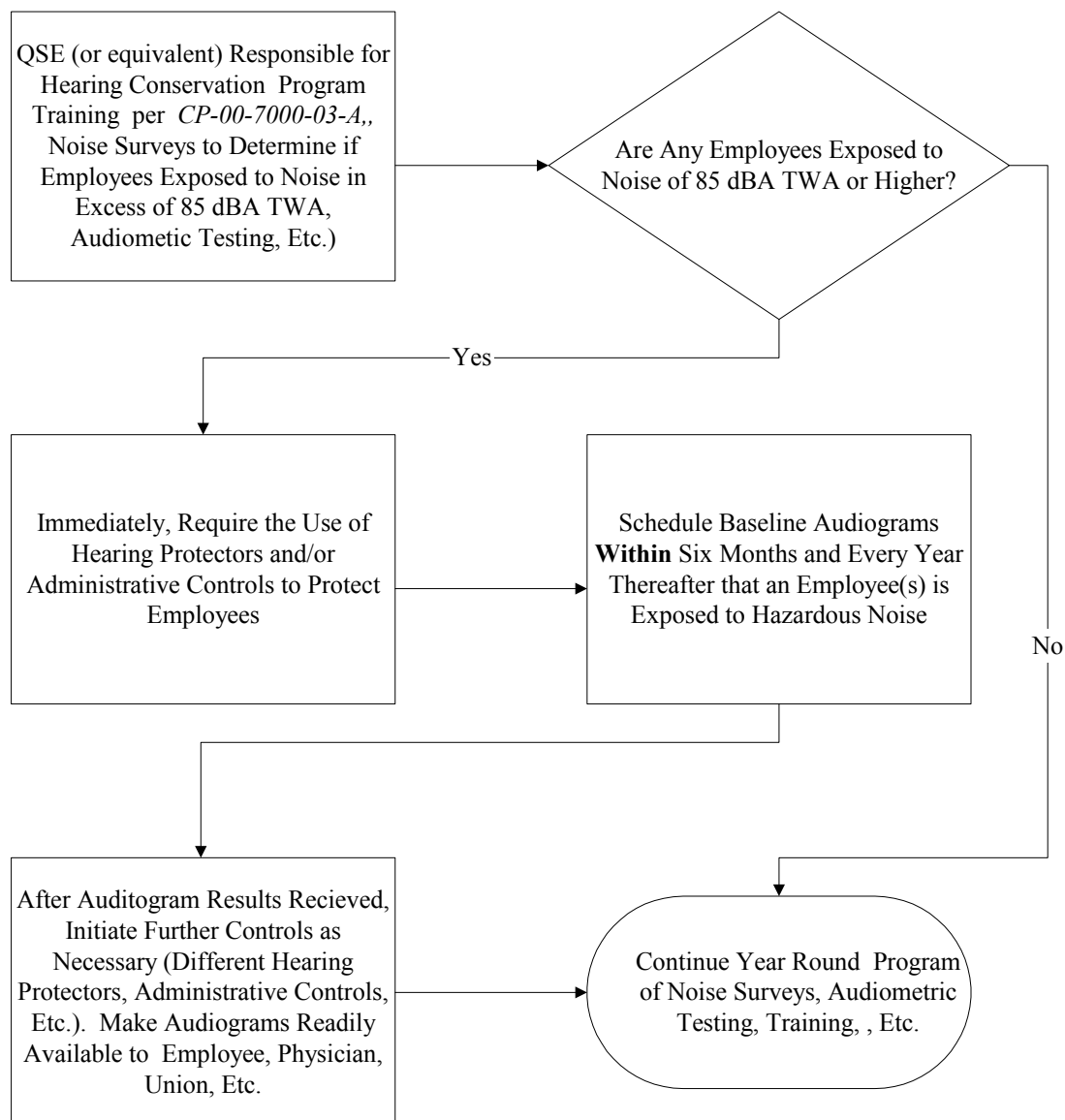
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5.0 REQUIREMENTS/PROCEDURES

Figure 1 - Hearing Conservation Program





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5.1 Permissible Noise Exposure

The following table lists the permissible noise exposure limits, per workday, employees are allowed to be exposed to without any engineering controls, administrative controls, or personal protective equipment (e.g., ear plugs):

Table A- Cal/OSHA Permissible Noise Exposure¹

PERMITTED DURATION			PERMITTED DURATION		
Sound Level (dBA)	Maximum Workday Exposure (Hours-Minutes)	Maximum Workday Exposure (Hours)	Sound Level (dBA)	Maximum Workday Exposure (Hours-Minutes)	Maximum Workday Exposure (Hours)
90	8-0	8.0	103	1-19	1.32
91	6-58	6.96	104	1-9	1.15
92	6-4	6.06	105	1-0	1.00
93	5-17	5.28	106	0-52	0.86
94	4-36	4.60	107	0-46	0.76
95	4-0	4.00	108	0-40	0.66
96	3-29	3.48	109	0-34	0.56
97	3-2	3.03	110	0-30	0.50
98	2-38	2.63	111	0-26	0.43
99	2-18	2.30	112	0-23	0.38
100	2-0	2.00	113	0-20	0.33
101	1-44	1.73	114	0-17	0.28
102	1-31	1.52	115	0-15	0.25

¹ When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 + \dots + C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

(NOTE: For continuous or intermittent (non-impact) noise, exposure over 115 dBA is forbidden.)

(NOTE: For impulse or impact exposures, 140 dB is the maximum, unprotected level authorized. Examples of impact or impulse noise include hammer blows, explosions, etc.)



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5.2 Noise Surveys

When there is uncertainty as to the noise levels of SBAR operations and/or the exact type of hearing protection is uncertain, the appropriate QSE Office is responsible for obtaining noise surveys. Additionally, QSE ensures time-weighted average (TWA) calculations are completed to determine 8-hour exposure levels/representative exposure.

5.3 Audiometric Testing

Through surveys and TWA calculations, QSE determines who requires Baseline Audiograms and yearly testing. This testing is mandatory for anyone exposed at or above the Action Level, 85 dBA TWA, and a certified examiner (i.e., audiologist) must conduct the testing in a certified audiometer booth, e.g, a booth certified by federal or state OSHA, as applicable. Further, testing is preceded by at least 14 hours without exposure to noise.

In cases where there has been or there is suspicion that there has been an occupational hearing loss and/or a STS has occurred, QSE, the physician, the employee, and the employee's management/supervision must work closely together. In addition to work related loss of hearing, the following can also cause one to experience a STS:

- Disease/injury not caused by SBAR employment (e.g., medical pathology).
- Prolonged exposure to hazardous noise years before SBAR employment.
- Aging process.

In any event, all personnel concerned must work together to limit any further deterioration of an employee's hearing.

QSE schedules individuals for Baseline Audiograms within six months of an individual being exposed to noise at or above the Action Level. Experience has shown that the following types of positions require audiometric testing:

- Corrosion control personnel (e.g., mechanical tooling)
- Operations and maintenance technicians (e.g., mechanical rooms, jack hammers, heavy equipment operators/maintainers)
- Power plant operators



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(NOTE: As SBAR obtains more business, there will undoubtedly be more employees who will require audiograms.)

5.4 Engineering/Administrative Controls

Because SBAR does not own or control the areas we work in where hazardous noise is present, engineering controls are seldom used to control exposure to hazardous noise. As for administrative controls, these primarily consist of limiting the amount of time an employee can be exposed to hazardous noise. (NOTE: Usually required if there has been an Occupational Hearing Loss and/or STS.) However, administrative controls are only effective if accurate and up-to-date noise surveys are used and employees are strictly controlled. Therefore, the primary method of protecting employees from hazardous noise is the use of hearing protection.

5.5 Use of Hearing Protection

Two types of hearing protection are provided. They are aural inserts (ear plugs) and circumaural protectors (ear muffs). Managers and supervisory personnel are responsible for ordering a sufficient supply of these items.

To determine which type of protector provides adequate protection for a given noise, consult the protector's Noise Reduction Rating (NRR). QSE makes this determination utilizing Appendix E, T8 CCR 5098 or equivalent.

Ear muffs require special attention to ensure perspiration does not degrade and or stiffen the seal material. Additionally, care must be exercised in selecting the proper size muff and ensuring eyeglasses do not interfere with a good fit. Further, if a hard hat is required in a specific situation, ear plugs should be used and/or the ear muffs are an integral part of the hard hat.

The following are examples of areas/operations that are designated Hazardous Noise Areas; therefore, hearing protection is required.

- Needle gun and wire wheel grinding operations.

(NOTE: Ear plugs or ear plugs and ear muffs are suitable protective equipment. Ear muffs by themselves are not suitable.)

- Power plant bay area when one or more generators are running.



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(NOTE: If personnel are transiting the bay, hearing protection is optional. Either ear plugs or ear muffs are acceptable protection.)

- Mechanical rooms.

(NOTE: Either ear plugs or ear muffs are acceptable protection.)

- Steam boiler rooms.

(NOTE: Hearing protection only required for maintenance; not necessary for daily inspection.)

(NOTE: Either ear plugs or ear muffs are acceptable protection.)

- Airfield operations when aircraft engines are operating.

(NOTE: Ear plugs and ear muffs required.)

- Any other operation or facility where the 8-hour TWA is greater than 85 dBA and/or the area is posted requiring hearing protection.

(NOTE: QSE specifies the type of hearing protection/administrative controls necessary to ensure personnel are properly protected.)

5.6 Training

Personnel, who are exposed to hazardous noise and their supervisors, are trained using [SBAR Hearing Conservation Training Syllabus \(CP-00-7000-03-A\)](#). This training is given under the following conditions:

- New employee safety training.
- Prior to an existing employee's assignment to work in an area where exposure to hazardous noise is expected.
- Annual refresher training is required for all employees exposed to hazardous noise.

Training includes:

- The effects of noise on hearing;



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- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care;
- The purpose of audiometric testing, and an explanation of the test procedures; and
- How to access hearing conservation program information

5.7 Access To Information and Training Materials

The QSE Office maintains copies of all noise surveys, and wherever possible, surveys are also maintained at the applicable facility. Employees, their physicians, and their collective bargaining agents are granted access to this information upon request.

Audiometric test results are maintained in the individual employee's medical records or QSE maintains these records. As with the noise surveys, employees, their physicians, and their collective bargaining agents are authorized access upon request.

Finally, upon award of a new contract, the above information is transferred to the new employer.



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