

APPENDIX H—JOB AID: STEPS AND CHECKLISTS FOR CONDUCTING A NOISE INSPECTION

H.1 Pre-Inspection Activities

1. CSHO receives an assignment with potential exposures to noise.
2. CSHO prepares for inspection:
 - a. Calibrates noise equipment and documents calibration for sound level meter (SLM), noise dosimeters, and octave band analyzer (OBA).
 - b. Brings necessary OSHA forms to record measurements.
3. CSHO researches previous history on company (e.g., previous noise citations).

H.2 Opening Conference

Note: Attempt to open early in the day, as close to the commencement of the workday as possible (this will not always be possible). Especially if the inspection is a complaint, hold an abbreviated opening, and then proceed directly to the complaint or referral area to deploy dosimeters, take initial SLM readings, and conduct a rough sketch of the area.

1. Explain purpose, nature, and scope of inspection.
2. CSHO requests the following records/information for review, if available:
 - a. 300 Logs—Check for recordable hearing losses in the Hearing Loss Column (M)(5).
 - b. Audiograms for the previous 3 years.
 - i. Determine if any worker should be recorded on 300 Logs (both situations must exist in same ear: STS and 25 dB above audiometric zero).
 - c. Employer noise sampling data.
 - d. Departments/areas where noise may be an issue.
 - e. Training records for hearing conservation program.
 - f. Schematic diagram of facility (for noise mapping).
3. Ask if hearing protection is required or voluntary anywhere in the facility.
 - a. If so, document type of hearing protection provided to workers.
4. Question union representative on noise and hearing conservation efforts.

H.3 Walkaround

1. CSHO will conduct noise screening to determine whether dosimetry is necessary. Remember to lead by example! Conscientiously wear your hearing protection and other appropriate personal protective equipment consistently and correctly during your inspection.

- a. Record noise levels on schematic diagram or draw your own floor plan of area(s) where screening was conducted.
- b. Document sources of noise (e.g., machines, processes).
- c. Take SLM measurements in worker's hearing zone (2-foot diameter sphere around head) and document those results.
- d. Take photos of workers with improperly worn earplugs and workers in noisy areas without hearing protection (interview these workers later).

Building rapport is important. Use a conversational tone and take an interest in what is going on. This approach will foster a practical dialog and helpful information exchange.

2. CSHO will interview workers in elevated noise areas >80 dBA.

- a. Examples of questions to ask workers related to noise:
 - i. In your opinion, is today a typical noise exposure day?
 - ii. In your opinion, what are the loudest jobs at work?
 - iii. So, tell me, when you first started working here or when they first gave you hearing protection, what happened?
 - iv. Did you get a choice as to what type? What types are available?
 - v. Did anyone explain why you have hearing protection and where and when you need to use it? How did they do that?
 - vi. (Depending on the type of hearing protection used, the questioning might go different ways--e.g., disposable, muffs, reusable plugs).
 - vii. Are you supposed to wear hearing protection? If so, how often? (Note: If worker answers "no," ask why he/she doesn't wear it).
 - viii. Are there certain jobs or areas where you must wear hearing protection?
 - ix. In what areas in the facility are you required to wear hearing protection?
 - x. Does anyone check to see if you are wearing your hearing protection? What happens if you are not?
 - xi. Do you routinely get new hearing protection when it wears out?
 - xii. Were you fitted for your hearing protection?

CSHOs shouldn't feel that they are limited to scripted questions but should be flexible to pursue relevant leads and unanticipated responses. It may be helpful to comment on observations, particularly at the time and in the area of the observation (e.g., I see some people wearing earplugs and others not using anything. Why is that?)

- xiii. Were you trained on how to wear your hearing protection properly? (Have worker demonstrate wearing hearing protection)
- xiv. Were you trained on how to use and care for your hearing protection? (Note the content of training and date of training)
- xv. Have you ever been given a hearing test while working here?
- xvi. About how often do you get hearing tests?
- xvii. If so, when was your last audiogram given?
- xviii. Who administers your audiogram?
- xix. Do you have problems hearing (e.g., tinnitus, TTS)?
- xx. What is the frequency and duration of noise exposure?
- xxi. When would be the best day to return to sample for noise? (Note: You want the worst typical noise exposure day to sample—when the most machines are running)
- xxii. If the CSHO returns to conduct full-shift sampling, ask workers these additional questions:
1. How often do you work on this machine? (e.g., hrs./day, days/week, days/month)
 2. How many pieces are produced/generated per day?
 3. Do the noise levels vary with customer specifications for specific materials?
- xxiii. Has the company made any effort to reduce noise levels?
- xxiv. What is your opinion of the practicality of control measures?
3. If noise-screening results indicate elevated noise levels (e.g., 80 dBA or above), be prepared to sample on the day of the opening. **Develop a noise-sampling strategy** based on screening results and worker interviews. Note: It's amazing how many machines tend to go out of service

CSHOs should try TO DO DOSIMETRY THE DAY OF THE OPENING! Sometimes a return trip is necessary, but as a general rule, one should be able to start sampling ASAP. It takes very little time to deploy the dosimeters, and significant data are lost by not seizing the opportunity. You typically can get 6+ hours in these situations, which often is sufficient to support a citation. Another option is to open later in the day and do a full-shift sample in the evening. Second shift is a great time to sample, as these are often the less experienced employees and supervisors, and it is not unusual to find more problems in the after-management, normal-working-hours shifts.

Look at dosimeter readings. If you have an overexposure, make sure it is well documented. However, if the projected dose exceeds or was close to the PEL, and sampling time was inadequate, then return for full-shift sampling. If the projected dose was well below the PEL and AL, then the complaint was addressed in a defensible fashion, and sampling can end if no other hazards are observed.

when a facility knows that you are returning to do sampling. Typically you can get 6+ hours, which is often sufficient to support a citation. However, if a return trip is necessary, the CSHO will notify the employer that he/she will need to set up full-shift sampling for another day to assess the noise levels at the facility.

4. Indicate to the employer how many workers you would like to sample and in what areas of the facility; this will permit them to make appropriate arrangements.
5. Schedule a date to return to the facility for full-shift sampling (Note: Make sure that it's a typical exposure day, representative of the routine high noise levels that you recorded during your noise screening).
6. If workers are on an extended workshift, then you must calculate a revised AL using the formula in Section IV.B.2—Extended Workshifts in this chapter.

H.4 Full-Shift Sampling

1. Pre-calibrate noise dosimeters, sound level meters, and octave band analyzers; fully document calibration on proper OSHA forms.
2. At the start of workshift, or immediately after an abbreviated opening conference, place noise dosimeters on workers. If related to a complaint or referral, be careful to first select workers who will address any specific concerns in the referral or complaint, as these items must be addressed. The other workers should be selected based on highest anticipated exposures.
 - a. Explain to each worker being sampled who you are, why you are there, and the purpose of the dosimeter. Emphasize that the dosimeter is not a speech recording device. Explain, as part of the documentation, that you will be taking pictures of them doing their work and to show how the dosimeter was worn.
 - b. When the dosimeter is positioned (generally at the waist), clip the microphone to the worker's shirt collar at the shoulder, close to the worker's ear. Clips should be placed in accordance with manufacturer's instructions. Position and secure any excess microphone cable to avoid snagging or inconveniencing the worker. If practical, the cord should run under the worker's shirt or coat. If possible, place the microphone on the side of the worker closest to the primary noise source, if there is one.
 - c. Once the dosimeter is in place, ask the worker if it feels all right, confirm that the cord is not in the way of their work, and emphasize that the worker should continue to work in a routine manner.
 - d. Tell the worker that you will check back regularly and to let you know right away if there is a problem with the unit or with wearing it. Instruct the worker being sampled not to remove the dosimeter unless absolutely necessary, and not to cover the microphone with a coat or outer garment or move the microphone from its installed position. Let the worker know when the dosimeter will be removed. For example, explain to the worker that you will be collecting the noise dosimeters prior to lunch, and then after lunch, you will resume sampling them.
 - i. If workers eat in their work area and lunch is part of the 8-hour workshift, you might consider leaving the dosimeter on during lunch.

- e. *Record necessary information about the worker (e.g., job title, name of department, job description, type of hearing protection worn, length of employment, frequency and duration of noise exposure) on the appropriate OSHA form.*
- f. *Explain to the workers that you will be checking the noise dosimeter throughout the day (to ensure that the microphone is oriented properly) and taking direct reading measurements with your SLM in their hearing zone.*
- g. *Record the time you turned on the noise dosimeter(s).*

Always document the type of hearing protection worn by the worker. When the type and model of personal protective equipment is not recorded on the sampling sheet, it is difficult to confirm that the hearing protection's NRR is adequate to protect the worker from the measured

3. *During dosimeter sampling, to evaluate the noise hazard(s), document the following types of noise inspection data for each worker sampled:*

- a. *Take at least 10 periodic SLM measurements in each sampled worker's hearing zone, and obtain and note SLM readings (A- and C-weighted) during different phases of the work performed by the worker during the shift. Take enough readings to identify work cycles and the contribution of different noise sources from machine(s) and/or processes. Take notes to identify the level of each noise source (fully document on appropriate OSHA form). A and C readings will assist in determining noise-control measures. Octave band readings are a better alternative. Examples of noise sources might include adjacent workers/machines; compressed air blow-off; and metal on metal from punching/sawing/drilling, hydraulics, electric motors, rollers, parts falling into bins, and grinders. More readings should be taken when noise levels fluctuate widely. Hone in on noise sources by following noise gradients (take note of where SLM levels increase). It is often possible to identify the parts of the machine or process that are the major contributors to overall noise levels by following these gradients. Thus, these are the most important to address with appropriate controls. It might just take tightening some bolts or installing a new dampening gasket to significantly reduce the noise.*
- b. *Ask workers periodically during sampling if this is a typical work day for noise exposure. (Note: If the CSHO finds out it is a light day for noise exposure and no overexposure exists, he or she might need to come back another day to sample.) If workers are not at their workstations when you do your checks, it is important to follow up and determine where they were and what they were doing for that part of the shift, and ask whether it is unusual for them to work elsewhere.*
- c. *Include a brief description of the machine and/or process contributing to the noise levels.*
 - i. *Record octave band analysis readings only if they have significant identified noise source(s) (e.g., exposures >132% dose) so this information can be provided to the employer to assist in determining the type of engineering controls.*

- d. *Record the condition of the machine (find out who performs maintenance on machine/equipment and review any maintenance records).*
- e. *Record machine operation (e.g., speed, cycle, part/min).*
- f. *List noise sources for worker (primary, secondary, tertiary).*
- g. *Identify existing controls.*
- h. *Measure distance from worker to the primary noise source.*
- i. *Ask whether the worker's presence in the noise field is required for the job.*
- j. *Ask questions about hearing protection (type, properly worn, worn at all times, choices of hearing protection offered, is the attenuation sufficient for the worker's noise exposure?).*
- k. *Observe how worker is wearing hearing protection (e.g., foam plugs); if worn incorrectly take a picture. In addition to noting the type of hearing protectors the sampled worker is wearing, it is also important to note whether:*
 - i. *Other workers in the area are wearing hearing protection.*
 - ii. *Workers passing through the work area (e.g., maintenance workers) are wearing hearing protection.*
 - iii. *Supervisors in the area are wearing hearing protection.*
 - iv. *Hearing protection is worn correctly.*
 - v. *Workers are observed traveling from one noise area to another in the facility.*
- l. *Record the size and shape of the room.*
- m. *Note surface materials on floors, walls, and ceilings, and any acoustical treatment.*
- n. *Take photos of the overall operation/machine as well as photos of noise source(s) and where worker(s) is in relation to the noise source(s).*

Try to have a company representative accompany you during the data collection part of the inspection. It is an opportunity to present the findings in a hands-on manner on the plant floor (almost like a hands-on pre-closing conference). It reduces confusion at the closing and misunderstanding of the citations, and it improves communication. It is also a time to get useful employer statements (e.g., Yes, this has been a long-standing problem, but corporate doesn't want to spend the money now; That just broke, we have a new muffler on order, I can show you the PO); achieve consensus on possible fixes; and point out problems that the employer may really not have known about. It is also a good time for practical instruction so that the employer walks away with an understanding of the problem, its significance, and possible solutions.

- o. Make an initial determination of potential noise controls. If you are recommending engineering controls, you need to take tape measurements while in the facility to determine square footage of acoustical controls and to see if barriers, booths, and other components will fit. Cost comparison calculations depend on these measurements.*

4. End of normal 8-hour shift:

- a. Remove dosimeters and record time on OSHA form.*
- b. Ask worker if this was an average work day for noise exposure (normal production day vs. sampled day production).*
- c. Record results of dosimeter sampling on appropriate readout worksheet.*
- d. If this is an extended shift, it is important to document the exposure just before or at the 8-hour mark to provide the 8-hour TWA exposure for comparison against the PEL. One can document zero exposure during lunch and subtract that from the sampling time if the dosimeter is not turned off (make sure there are no loud noises during lunch that can contribute to the noise dose [e.g., radio turned high in car or lunchroom]). Once the 8-hour exposure is determined, you should continue to allow the dosimeter to collect data to determine the severity (e.g., continual noise exposure during last 2 hours of a 10-hour shift can increase severity of the citation) based on full extended-shift sampling.*
- e. Complete all information on OSHA noise survey report.*
- f. Post-calibrate noise equipment and fully document calibration; this is often done after leaving the site.*

One could demonstrate a calculation where the CSHO allowed the dosimeter to accumulate for 8.5 hours (e.g., not collecting it at lunch and not documenting the exposure during the lunch break), and with significant noise in the first 5 minutes and last 5 minutes of the slightly extended work shift, and never be over the 8-hour PEL. This is the reason to take SLM measurements throughout the work shift to fully

- 5. Notify employer of noise sample results prior to leaving worksite and note the employer's opinion of practicality of control measures.*
- 6. Review relevant records (e.g., hearing conservation program).*
- 7. Conduct additional interviews with employer and worker regarding employer's hearing conservation program and feasibility of engineering controls.*
- 8. Request copies of manufacturer's instructions on machine(s) and/or processes contributing to high noise levels (can help to establish knowledge and assist with determining potential engineering controls).*
- 9. Explain to employer that you will arrange for a closing conference with him/her to review your inspection findings.*

H.5 Post-Inspection Activities

1. There are several scenarios (e.g., given in the OSHA FOM [CPL 02-00-148] and CPL 02-02-035 [Guidelines for Noise Enforcement: Appendix A]) for how to enforce our noise standard. Based on the specific inspection, the CSHO needs to select the correct scenario that applies to that situation. For example, if noise exposures are >132% dose, or an equivalent 8-hour TWA exposure of 92 dBA (90-dBA threshold), and feasible engineering controls are cost-effective, then cite 1910.95(b)(1) and conduct the following:
 - a. Perform a cost comparison using your regional office's cost estimation for the average cost of a hearing conservation program. As of 2011, the national average annual cost of a hearing conservation program is approximately \$350 per worker.
 - b. Research examples of technically feasible engineering controls for the specific machine and/or process contributing to the noise levels. Start with the equipment manufacturer.
 - c. Start with easy solutions first.
 - d. Once the engineering control has been determined, contact noise-control manufacturers to obtain prices for doing your cost comparison for determining economic feasibility (engineering controls vs. hearing conservation program). Region III's Directive: STD 1-4.1A "Enforcement of the Occupational Noise Exposure Standards, 29 CFR 1910.95, 1926.52, and 1926.101, Inspection Procedures and Interpretive Guidance" can be used to provide assistance with the cost comparison process. Located at <http://intranet.osha.gov/Region3/ref/noise.pdf>.
2. After the cost comparison is complete and it has been determined that the cost of engineering controls is less than the cost of a hearing conservation program, write a citation for 29 CFR 1910.95(b)(1). In addition, cite for any deficiencies in the employer's hearing conservation program.
3. Another scenario may involve an 8-hour TWA exposure >100 dBA (90 dBA threshold), and hearing protection alone may not reliably reduce noise levels to levels specified in Tables G-16 or G-16a of the standard (economic feasibility or cost comparison is not necessary in this situation). The CSHO researches examples of technically feasible engineering controls for the specific machine and/or process contributing to the noise levels. Start with easy solutions first. Once examples of controls have been determined, write a citation for 29 CFR 1910.95(b)(1). In addition, cite for any deficiencies in the employer's hearing conservation program.
4. Another scenario may involve 8-hour TWA exposures between 85 dBA and 90 dBA (80-dBA threshold). The employer has an existing hearing conservation program. The CSHO shall review the existing program and cite for any deficiencies in the program. Cite 1910.95(c)(1) and deficient elements of the program.

During the closing conference, it is important to explain how each of the proposed citations presents a hazard and why you are proposing it. It is in everyone's best interest to understand the significance of the hazard and not just that it is a violation. Employers react more favorably when there are no surprises in the citations. It is also important to listen at the closing; there may be information that can affect the citation.

5. Another scenario could involve 8-hour TWA exposures between 85 dBA and 90 dBA (80-dBA threshold), but the employer has no existing hearing conservation program. The CSHO shall cite 1910.95(c)(1) only.

H.6 Closing Conference

1. Discuss apparent violations.
2. Provide copy of sample results.
3. Discuss abatement (e.g., review engineering controls that you are recommending).
4. Discuss possible citations.
5. Discuss informal conference.
6. Discuss contesting.
7. Discuss posting requirements.

H.7 Follow-up Inspection

Once abatement has been completed; the CSHO will conduct a follow-up inspection to verify the effectiveness of the engineering controls.

H.8 Example questions to ask employer about hearing conservation and noise:

- What are your loudest areas of the facility and the loudest operations?
- Do you know what the sources of noise are here?
- Where does the noise come from?
- What is your role in the hearing conservation program at this facility?
- Is there is list of departments included in the hearing conservation program?
- Do you do any training related to noise? If so, how is this accomplished?
- Do you have records that support your training on noise?
- What type of noise monitoring have you done? (Ask for copy of results).
- How often do you conduct audiometric testing on your workers?
- Do you keep audiometric test results? To make sure your hearing conservation program is effective, we will need to look at the audiometric test results for your workers to make sure everyone is included who needs to be.
- Can you think of anyone who has had an STS or has had some hearing difficulties? (Note: Explain to the employer what an STS is.)

The specific penalties should not be discussed—just the possibility that there may be penalties assessed as a result of the inspection.

- *Do you have a list of those workers who had an STS during the past year?*
- *Who performs the audiometric testing? (Note: Obtain name of company and address.)*
- *Could we see copies of calibration of the audiometric booth? (if testing is conducted on site)*
- *What types of hearing protection are available?*
- *Is hearing protection required to be worn or voluntary?*
- *If required, who enforces the use of hearing protection?*
- *Who conducts the training for hearing?*
- *Have you evaluated the attenuation of the hearing protection offered here?*
- *How are hearing losses recorded?*
- *Who determines which hearing loss cases are recorded?*

This job aid is intended to provide CSHOs with a nonmandatory approach to conducting noise inspections. CSHOs may use this job aid, may modify the job aid, or may use any approach they feel is the most appropriate for the inspection. This job aid does not set any new OSHA policies or requirements.