

Improving the Use of Hearing Protectors through Motivation

- 동기부여를 통한 청각 보호구 사용증대 방안 -

Min-Yong Park *

Abstract

Hearing protection devices (HPDs) are currently the most common countermeasure against occupational noise-induced hearing loss. Use of HPDs is only effective when they are properly worn. However, industrial workers often do not wear them, posing a serious under protection. This paper analyzes several motivational strategies which might be applied to improve HPD use in the field. It was concluded that such methods could readily be implemented in the workplace to protect workers exposed to hazardous industrial noises.

INTRODUCTION

"Safety is not a program in a manual - it's an attitude. A company could be spending millions of dollars on safety, but if it hasn't reached the employee, nothing counts."(Verespej, 1991, p.38) Employers must not only convey the necessity of safety - specifically, hearing protection devices (hereafter, HPDs), but more importantly, must ensure their implementation.

For too many companies, a hearing protection program consists of buying hearing protectors and distributing them to employees. However, effective hearing conservation must be based on a comprehensive effort to prevent noise-induced hearing loss. Such an effort must include adequate education, indoctrination and motivation (Gasaway, 1984). The focus of this paper is on the motivational aspects of such a program.

BACKGROUND ON NOISE

Noise is physical energy and can cause direct, physical damage to unprotected ears (Gasaway, 1987). If a worker must raise his voice to be heard from a foot away or must shout to be heard at a distance of three feet, then the noise level is dangerous. Additionally, all loud impact noises (*from drop forges, metal shapers, guns, etc.*) are harmful to unprotected ears; protection is always required (Gasaway, 1987). It is imperative that precautionary measures be taken to ensure the safety and health of all workers with respect to noise induced hearing loss.

Dangers of Noise Induced Hearing Loss

There are many dangers associated with noise, not only to one's hearing, but also as a contributing factor in hypertension and coronary disease (Harris, 1980). Noise-induced hearing loss occurs over years of exposure. However, a temporary decrease in hearing is often prevalent after a period of exposure to loud noise. This phenomenon is termed "temporary threshold shift" or TTS. Within an hour or so after being away from the noise, hearing returns to normal (Harris, 1980).

* Department of Industrial Engineering, Hanyang University, Seoul, Korea.

Associated implications/costs of noise-induced hearing loss. Although a hearing conservation program may appear to be substantially expensive for a company to implement, it may actually be cost effective. The saving in compensation claims will pay for the program many times over (Gasaway, 1984). A dollar value cannot be placed on preventing a hearing loss in a valued and loyal worker in his or her later years. Additionally, the cost of compensation for employee hearing loss is high and can be expected to continue rising. Insurance companies are beginning to regard noise as a serious liability (Harris, 1980).

OSHA regulations. The Occupational Safety and Health Administration (OSHA) regulations (OSHA, 1991) require that workers in an environment of 85dB or greater must participate in a hearing conservation program (Bryan, 1989). One important part of such a program includes the training of workers to recognize and protect themselves from the hazards of noise in the workplace.

One method of protection from excessive noise is the use of personal ear protection. Ear protection is approved under the regulation until such time as feasible engineering or administrative means can be found to reduce the exposure of the workers (Harris, 1980). However, in some industrial operations, it is doubtful if noise reduction will ever be possible. Personal ear protection, if properly worn, can reduce noise exposures and can prevent hearing loss caused by occupational noise.

Worker Recognition of Hearing Loss

Noise is associated with many daily activities that people do not tend to think of as a threat. Also, a person's body gives few, if any, physiological signs when damage occurs: no pain, no bruises or bleeding, as with other kinds of injury (Gasaway, 1984). Furthermore, noise-induced hearing loss occurs very slowly, usually over many months or years, so that hearing is already seriously compromised before most people are ready to recognize that day to day unprotected exposures may have serious consequences.

There is rarely any clear indication when damage of injury occurs. Presently, there is not any medical or surgical procedure which can restore the loss of hearing associated with excessive noise exposures. It is relatively easy to persuade someone to wear eye protection by showing him or her a picture of a person who didn't wear goggles and got a sliver of metal in his or her eye. Unfortunately, hearing loss does not lend itself to such vivid imagery. Therefore, a more deliberate and systematic approach must be used to persuade or motivate workers to consistently and properly protect their hearing (Gasaway, 1984).

MOTIVATION

"The old maxim that knowledge is power is erroneous. In reality, there is nothing as sterile, dead, or as unimportant as the greatest idea in the world unless it is put into people and the people move into action" (Bellanca, 1982, p.15). In industry, this translates to the obligation to not only inform workers of hazards, but more importantly, to convince them to take the necessary precautions to avoid or minimize such hazards. Specifically, noise-induced hearing loss can be controlled through the proper use of HPDs. Employers must not only inform workers of the dangers associated with noise, but also compel them to take measures to protect their hearing. In meeting this challenge, health and safety educators have found success through the use of various tactics. These tactics will be divided and analyzed from two basic groups: strategies and management techniques.

Tangible Strategies to Increase Worker Motivation

Tangible strategies are concerned with physical programs or activities which a company can readily implement. These programs are effective in the sense that employees can actually participate and distinguish between the various techniques applied.

Rewards/Incentives. Many plants reward outstanding compliance with safety and health regulations. These incentives are limited by what one's imagination and the company's budget allow (Gasaway, 1984). The purpose of incentives is to reward people for protecting their hearing. Geller defines rewards and incentives in his article as : "Rewards are consequences that increase the probability of safety belt use, and activators for announcing the availability of a rewarding consequence for belt use are termed incentives" (Geller, 1988, p.633).

There are several guidelines to follow when awards/incentives are offered. As the rewards of wearing hearing protectors become more evident to the user after a period of regular use, a more immediate reward is needed to persuade the employee to overcome any initial difficulties. The immediate reward should be in a form not normally associated with hearing conservation. Once the wearer has crossed the threshold, the fact that he or she feels better for using the protectors will be sufficient reward in itself and the external reward can be withdrawn; and the resistance threshold should be as low as possible. In other words, the hearing protector supplied should be the most comfortable one available (Gasaway, 1984).

One example of a reward is to distribute lottery tickets or tokens to those who correctly wear HPDs. A study performed on a college campus surrounding the use of safety belts in automobiles will be used to further illustrate such a reward system (Geller, 1988). Interested students and faculty were asked to sign a "buckle up" pledge. The signing of this pledge card implied a commitment to use vehicle safety belts for an entire academic quarter. Returning the lower portion of the pledge card to conveniently located raffle boxes enabled entry into random drawings of prizes donated by local merchants. It was found that those who signed the buckle up pledge were always more apt to use a safety belt than those who did not. Promoting safety belt use by rewarding individuals for signing a buckle up pledge card had been termed an indirect reward strategy. This is in contrast to the direct approach whereby individuals were rewarded directly for using a safety belt. Direct rewards are immediate consequences when vehicles are stopped and occupants are rewarded on the spot for being buckled up. Research has shown these reward strategies to be equally effective for motivating the use of vehicle safety belts. Similar reward strategies can be applied to promotion of HPD use.

Another example may be illustrated by a company which took photographs of employees taking positive steps to avoid injury or losses related to a specific subject (Gauscht and Esson, 1987). The photos were sent to a poster company where large twenty by thirty inch posters were made. During the first week of every month, one poster was placed on the cafeteria wall. The other poster was given to the employee in the picture to take home. Likewise, pictures of properly used HPDs can be used in the same manner.

Awareness. Articles and reminders of hearing safeguards in the plant newsletter are helpful in keeping workers aware of the consequences of hearing loss when ear protection is not used. Additionally, such articles can facilitate rewarding employees who comply with a hearing conservation program. Recognition and/or pictures of such employees can be placed in a newsletter outlining the positive steps the employee is taking.

Another effective awareness technique is the use of slogans. Such slogans or campaigns can be changed on a monthly basis. One company passed out Tootsie Rolls ("We're on a roll"), bubble gum ("Don't blow it now") and peanuts ("Safety ain't peanuts") (Verespej, 1991).

Additionally, the use of films, brochures and posters are often helpful. Insurance carriers can frequently furnish these items at little or no cost to the company. Such tactics serve as a constant reminder to all of the importance of safety. Furthermore, presentations by guest speakers or the president of the company tend to have a rather large impact on audiences (Zohar and Azar, 1980).

Inspections. Periodic inspection visits to work areas by health and safety personnel can serve several important function. The visibility of such inspections motivates workers to use hearing protection and other safety devices, and their presence is a reminder that noise is a genuine threat (Gasaway, 1984). It is not enough to simply observe who is or who isn't wearing HPDs. Inspectors should actually examine the devices and their manner of use.

Feedback. Most hearing conservation programs are required by law to include audiometric monitoring (Berger, 1982). The results of these periodic examinations help document the success or failure of the program. They also can be a motivational device and are an excellent source of feedback. An annual audiometric examination that shows a worker's hearing is stable indicates he or she is getting adequate protection. This positive feedback should be communicated to the worker.

Routine annual audiometric examinations may be supplemented by short term audiometric monitoring. Such a test can uncover the effects of excessive noise. It consists of two audiometric exams, one at the start of the workday and another at the end of the day or after about four hours on the job. A comparison may reveal a temporary threshold shift (TTS) or auditory fatigue. This is a rather dramatic way to prove to a worker that he or she has been exposed to excessive noise. Such results may be posted for all to see. This public displaying may prompt workers in the desire to achieve a smaller TTS (Zohar and Azar, 1980).

Another similar method is to issue a worker a set of ear plugs. The person must agree to wear it throughout the entire shift and return to an office at the end of the day. After the employee return, the earplug is removed and the employee is then asked if there are any noticeable changes in hearing. The ear that has not been protected should have a decrease in hearing caused by TTS; the protected ear should not. Such feedback can be a surprisingly strong motivator. Basically, this type of information compares things, such as past and present performance. Since most people instinctively respond to achieve better cooperation (Zohar and Azar, 1980).

Another similar feedback method is to instruct employees who do not use HPDs to leave their radio on after they are home. The next morning the worker may have noticed that the radio appears to be considerably loud and must reduce it. It should be pointed out that the radio was turned up because of a temporary loss of hearing at the end of the prior work shift and that this temporary loss has a cumulative effect (Gasaway, 1987).

One drawback of audiometric testing is the possible implications of test results, especially from unions and insurance claims or to evoke mass requests for transfers to jobs in other quieter departments (Zohar and Azar, 1980). For example, testing results may find that certain workers may have already suffered a considerable amount of hearing loss, thus prompting a law suit. Although in the studies examined, such was not the case ; the possibility of implications remain a factor which should be considered.

Disciplinary measures/enforcement. Disciplinary measures should be a last resort. Whenever disciplinary action is contemplated, every effort should first be taken to learn why protection is not worn and such behavior should be modified (Hatcher, 1991). Disciplinary action is of limited value unless the reasons for noncompliance can be discovered and corrected. A citation for failing to wear hearing protection will rarely improve the situation unless the person involved

can be persuaded to take a more positive attitude (Gasaway, 1984).

Discipline when used must be firm. A formula used at many companies is a verbal warning for the first offense, a written warning for the second, suspension without pay for the third (usually for one or two weeks) and dismissal for the fourth offense (Zogar and Azar, 1980). A pattern of non compliance should be regarded as a cause for a worker's removal from potentially hazardous (possibly higher paying) high noise environments.

Disciplinary actions start when someone sees an employee who is not wearing hearing protection. Care should be taken during inspections to ensure that the user has not altered the devices so that they appear to be effective but in fact are not. This will often happen when a worker has been given a warning but is still not convinced of the value of hearing protection.

In such cases, wearers have modified their devices by a variety of means : punching holes in plugs, trimming or cutting off flanges, puncturing the air cavities of the plugs so that they collapse, or actually cutting off the tips of the plugs or devices (Gasaway, 1987). These bad practices often make HPDs more comfortable, but may completely negate their effectiveness.

Education. A good hearing protection program begins with education and motivation rather than enforcement (Harris, 1980). Education is necessary to emphasize the advantages of HPDs. Wearing muffs or plugs while working in a noisy environment increases worker productivity and reduces fatigue. Other important facts should include the prevention of permanent noise-induced hearing loss and the elimination of auditory fatigue. Hearing protectors usually do not interfere with warning signals such as evacuation whistles, fire bells or alarms from malfunctioning machinery (Gasaway, 1987). In addition, they keep foreign objects (dirt, etc.) out of the ear, preventing possible injury or infection. An employee who is educated in such adverse effects of noise should tend to understand the necessity of HPDs and thus be compelled to utilize them. However, many times additional methods must be used to motivate workers.

Management Techniques to Increase Worker Motivation

Many times specific programs and activities warrant additional or different motivational techniques. The basis for such additional tactics may stem from financial problems or ineffectiveness of previous techniques. There are a number of different ways a manager or supervisor can indirectly compel a worker to act in a certain manner. Particularly, the use of HPDs can be presented and stressed in such a way that employees will consistently comply with company policy regarding hearing conservation.

Management/supervisor support. "Management must energetically and visibly encourage the consistent use of hearing protection" (Gasaway, 1984, p.65). Management must make it well known that safety officer has been given the power and authority to conduct an effective program. If this power is understood, the implementators of a hearing conservation program will be able to make use of peer pressure to motivate employees to actively maintain safe and productive work environments. If management seems hesitant about fully supporting a hearing conservation program, it may be useful to point out the cost effectiveness of such a program. Studies show that programs are far more effective if a dedicated and highly motivated individual is in charge (Gasaway, 1984). A supervisor must remember to consistently reinforce positive safe acts. If a supervisor ignores an unsafe act, the act may then become the behavior standard for all employees in the future (Dumas, 1987).

Interest of employees. "In order to motivate someone, you must first discover his or her self interest" (Bellanca, 1982, p.15). The benefits of adopting regulations must meet an employees

own special needs. By causing a person to feel a certain way about a recommendation, the desired accomplishment can be motivated. Certain rewards can be offered to substantiate the employees value of certain proposed change. For example, free audiometric testing may be offered to the families of employees. If a hearing impairment is discovered in a family member, the emphasis is strong on the perseverance of one's hearing.

A case study detailed one company's success with such a program (Fragala, 1987). The plant manager asked employees to respond to a number of questions concerning safety. Perhaps the most interesting question asked was "Why do we come to work each day?" The participants were made to think of what people want and what their needs are. This is imperative for managers and supervisors to recognize in the attempt to motivate their employees. According to William James, a psychologist, the deepest urge in human nature is to feel important (Bellanca, 1982). If a person feels important, then a feeling will be created which will lend itself to an enthusiastic adoption of recommendations. By showing sincere personal interest in people, the supervisor or manager is catering to the strong need of the employee to feel important.

Group-dynamic effect. "If the majority of workers are using HPDs, then the majority of the other employees will follow" (Gasaway, 1984, p.64). Once the workplace undergoes a permanent modification of the work environment (use of HPDs), the result may be a behavioral change as well. This change is constantly reinforced by peer pressure and supervisor expectations. It may become respectable to wear HPDs, whereas previously it was not. The program can then become a self-sustaining activity. A large number of workers in a given group can create new norms and behavior standards favoring the use of HPDs.

Management/employee relationship. There are two reasons why people will adopt a recommendation (Bellanca, 1982). Either they like the person presenting it or they like the recommendation. People will readily adopt suggestions of a friend while ignoring the same suggestion from an acquaintance or stranger. "People will like you when they clearly understand you like them" (Bellanca, 1982, p.15). It is difficult not to like a friendly, happy, sincere, patient and understanding person. However, someone who appears angry, critical, argumentative and complaining creates feelings of defensiveness and destroys the desire of others to cooperate. It takes tremendous self discipline and practice to develop a habit of being friendly to everyone. The average person is more interested in his or her name than all the other names on the earth put together. If a person's name is used in a friendly, positive manner, he or she will be more agreeable to a recommendation (Bellanca, 1982). Such a recommendation could be to use HPDs. Repeating the first name in conjunction with important points enables point to be better absorbed from an otherwise wandering mind. The employee will be more inclined to center thoughts on what will be said next. Whenever appropriate, use first names and encourage others to use yours.

Example by management. It should be emphasized to management personnel that they too must wear HPDs when coming into noise areas even though in the short duration of their occasion, exposure would not be harmful. Management must set an example. Otherwise, if workers are forced to wear protection and they see supervisory personnel without it, they may become resentful and less cooperative. Management should also consider attending safety training session and should occasionally send letters or memorandums that clearly state the company's policies on hearing protection.

CONCLUSIONS

Hearing is sensitive, flexible and rarely appreciated except by those who have suffered hearing loss. Because of ignorance or carelessness, millions of workers have experienced some degree of occupational hearing impairment (Gasaway, 1987). Only a comprehensive hearing protection program can prevent widespread, irrevocable damage to this precious sense. One critical aspect of such a program is component of employee performance, that effective procedures and programs can be implemented to ensure the safest possible working environment (Bryan, 1989). Several motivational strategies were analyzed to help industrial workers enhance their HPD use in the field. It is concluded that such methods are readily effective when applied properly through the organization.

REFERENCES

1. Allen, Holly S. (1984). Motivating Employees to Appreciate Safety Programs. *Professional Safety*, July, 37.
2. Bellanca, Joseph J. (1984). Motivating Managers and Workers. *Occupational Safety & Health*, April, 15-17.
3. Berger, Elliot H. (1982). Motivating Employees to Wear Hearing Protection Devices. *Earlog #7*.
4. Bryan, Leslie A. (1989). The Human Factor : Implications for Engineers and Managers. *Professional Safety*, November, 15-18.
5. Downey, Robert E. (1987). Division Safety Coordinators Sell Safety. *Professional Safety*, April, 19-21.
6. Dumas, Roland (1987). Safety and Quality : The Human Dimension. *Professional Safety*, December, 11-14.
7. Fragala, Guy (1987). Implementing a Safety Program - a Successful Start. *Professional Safety*, June, 16-19.
8. Gasaway, Donald C. (1984). Motivating Employees to Comply with Hearing Conservation Policy. *Occupational Safety & Health*, July, 62-67.
9. Gasaway, Donald C. (1987). Developing an Effective Hearing Protection Program. *Plant Engineering*, February, 51-53.
10. Gauscht, Alice B. and Esson, Sally A. (1987). HIT - High Incidence Training for Safety. *Professional Safety*, July, 26-28.
11. Geller, Scott E. (1988). A Behavioral Science Approach to Transportation Safety. *Bulletin of The New York Academy of Medicine*. September-October, Vol. 64, No. 7, 632-661.
12. Harris, Dean A. (1980). Combating Hearing Loss Through Worker Motivation. *Occupational Safety & Health*, March, 38-40.
13. Hatcher, Eddy (1991). Positive Safety. *Training*, July, 39-41.
14. Hughes, Richard G. (1987). A Safety Director in the Land of Business. *Professional Safety*, March, 22-23.
15. Magill, Mark D. (1990). Incorporating the Safety Performance of the First-Line Supervisor into the Performance Appraisal System. *Professional Safety*, November, 19-22.
16. OSHA (1991). Occupational Noise Exposure. 29 Code of Federal Regulations, 1910.95, 204-220. Occupational Safety and Health Administration. Washington D.C. : U.S. Government Printing Office.
17. Verespej, Michael A. (1991). Safety Can be Fun. *Industry Week*, February 4, 30-31
18. Zohar, Dov and Azar, Naomi (1980). Promoting Increased Use of Ear Protectors in Noise Through Information Feedback. *Human Factors*, 22(1), 69-79.