

Noise Reduction Policy in the Dutch Construction Industry

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Introduction

Noise is a major occupational hazard in the construction industry. It is estimated that half of all Dutch construction workers are exposed to hazardous noise levels. Research shows that 38% of the workers in the Dutch construction industry complains about noise and that 17% of the workers complains about their hearing ability. Furthermore 43% of all reports of occupational diseases in the construction industry is a report of occupational hearing loss, while this number for the Netherlands in general is only 14%.

These figures are considerable, as is the impact of deafness or a hearing impairment. A hearing impairment can easily lead to social isolation, mainly because it is difficult to have a conversation, especially in a noisy environment (meetings, parties etc.). Hearing loss can also lead to dangerous situations, because people don't hear instructions or warning sig-

Noise project

The project consists of several phases. First of all, a picture of the current situation is created by means of several researches*, among which were a literature survey, noise exposure measurements, a survey among employers about their knowledge of the problem and an inventory of the solutions that are available to reduce noise exposure.

In the second phase of the project an action plan was made indicating the actions that have to be taken by different actors to achieve the reduction goal.

Noise exposure measurements

The measurements among pile drivers were performed by an other organisation than the measurements among the other groups. The results of the noise exposure measurements are

Table 1 Results of the noise exposure measurements for the five priority groups

Group	Number	Range [dB(A)]	AM [dB(A)]	Percentage ≥ 80 dB(A) (%)	Percentage ≥ 85 dB(A) (%)
Pile drivers	56	67 - 103	86	75	50
Road markers	11	78 - 90	83	64	27
Demolition workers	13	81 - 109	96	100	92
Operators of wood working machines	14	87 - 95	91	100	100
Road works machinists	31	81 - 99	88	100	74

nals. Only last year a Dutch construction worker with a noise related hearing impairment was run over by a reversing truck, because he didn't hear the truck, its 'reversing signal', or his colleagues who tried to warn him.

Because of the alarming figures and the considerable impact of deafness, Arbouw, an expertise centre on working conditions in the Dutch construction industry, has started a project on noise. The objective of this project is to reduce the amount of exposed people with 10%. For this project five priority groups were selected; pile drivers, demolition workers, road works machinists, operators of wood working machines, and road markers. These groups were chosen because of their size, the amount of complaints about noise and the level of exposure. The project has started in 2000 and will end in 2005.

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shown in table 1.

The results show that the daily noise dose of employees in the priority groups is usually higher than 80 dB(A); in the Netherlands this is considered to be a hazardous level. Levels above 85 dB(A) are frequently found among demolition workers, operators of wood working machines and road work machinists.

Complaints and awareness

When the exposure levels are compared with the percentage of employees that complains about noise (see table 2) it is found that the groups with relative low exposure (road markers) complain more than groups with high exposure levels (demolition workers, operators of wood working machines and road works machinists). This indicates that the reason to

complain about noise might not be noise itself, but something else; in case of the road markers for instance the unsafe feeling caused by traffic.

- A pile foundation underneath a building is usually made by driving prefab piles into the ground. This produces large peaks of noise. It is however also possible to use

Table 2 Percentage of employees in the construction industry that complains about noise and about their hearing abilities.

Group	Employees complaining about noise	Employees complaining about their hearing abilities
	(%)	(%)
Pile drivers	83	14
Road markers	67	18
Demolition workers	65	21
Operators of wood working machines	55	14
Road works machinists	46	14
Dutch construction industry	38	16

The fact that among the high exposure groups relatively few people complain about noise might indicate that these groups underestimate the noise exposure in their work. This might be true for employers as well. Only 67% of the employers who participated in the survey, said that there were employees in their company who are exposed to hazardous noise levels. This means that almost a third of the employers are not aware of a noise problem in their organisation.

Education

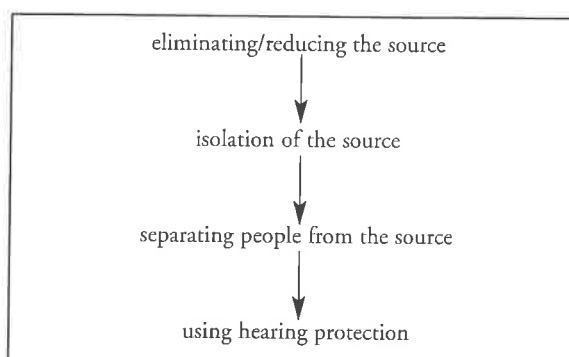
Despite the fact that not all employers consider noise to be a problem, all employers educate their people about noise. Usually this is done in a toolbox meeting or during a work meeting. 41% of the companies educate their employees at least once every 4 months about noise.

Apart from the employers other organisations in the Netherlands, like employee organisations, Arbouw, educational establishments and the government inform construction workers about the hazard of noise. It is generally assumed that all construction workers know that too much noise leads to deafness. This is confirmed by a research among the Dutch youth; 75% responded to an open question that too much noise leads to deafness.

Measures

The noise exposure measurements indicate that there is a noise problem among the priority groups. Good occupational hygiene practice requires that a noise problem should, if possible, be solved by taking measures at the source. If this is not possible, isolation of the source is the next step to be taken. The third possible measure is separating the people from the source. If all these measures are not reasonably possible, employers can use personal protective equipment to prevent exposure to hazardous noise levels.

The different studies showed that it is possible to reduce noise exposure by taking measures to eliminate or reduce the source or by isolation of the source. Some examples:



drilling methods and produce the pile *in situ*. This hardly produces any noise.

- When hydraulic clippers are used to demolish parts of a building instead of a pneumatic hammer, noise exposure is reduced.
- Roadmarkers would not be exposed to traffic noise, when the traffic would be diverted.
- Operators of woodworking machines can use a type of sawing blade, that produces less noise.
- Soundproof cabins on roadwork machines (and using them; closing doors and windows) diminishes noise exposure of the machinists.

In the questionnaire 67% of the employers said they had taken at least once a measure at the source in the last 5 years. However, during interviews and visits to construction sites, measures at the source or isolation measures were rarely seen. Furthermore it became clear that if employers take measures at the source, they usually do this to comply with the noise pollution act. This was confirmed by a search in the file of the Dutch construction newspaper. In the period between 1993 and 2001 38 articles reported about the use of a measure to reduce noise. In only one case this measure was motivated by occupational circumstances.

In an interview with the organisation of suppliers of machines, it was said that suppliers of machines are able to develop silent machines and silent production methods.

But they often don't do this because the client doesn't ask for them and the market is entirely based on demand.

Employers usually provide personal hearing protectors and see this as a solution of the noise problem even though only 49% of the employees in the Dutch construction industry uses personal hearing protectors every time they are exposed to noise. Only 18% of the employers apply sanctions when an employer doesn't use his personal protective equipment.

Conclusion first phase

The first phase of the noise project showed us that all priority groups are exposed to hazardous noise levels. And although people know that noise leads to deafness, people don't realize that they themselves or their own employees are at risk of becoming deaf. Employers think the noise problem is solved because they hand out hearing protection to the employees, even though they know that employees don't wear these all the time. Measures on a higher level, eliminating, reducing or isolating the source, are available, but are hardly used.

Continuation of the noise project

In the initial phase of the project the sources that contribute most to the noise exposure levels were assessed. Based on

these sources an overview of the most effective measures per priority group was made. Most measures will reduce noise at the source, but will take some time to be implemented. In order to reach the goal that was set (10% reduction), within the time frame of the project (5 years), it was decided to promote the use of personalized ear plugs among all priority groups. At the same time a second, long term, path is followed: reduce noise exposure by promoting the use of silent techniques and machines.

All actions that will have to be taken to achieve this, are divided into four steps:

1. making employers and employees aware of the noise problem
2. stimulating the willingness to make investments
3. develop measures
4. facilitate measures

When we review the outcome of phase one, it becomes clear that great effort should be put into the first two steps; making employers and employees aware of the noise problem and stimulating the willingness to invest in noise reducing measures.

At this moment all organisations involved are informed about the possible actions. The progress and outcome of the noise project will depend on the willingness of these organisations to participate.