

Atelier : La diffusion de l'information sur la maîtrise du bruit : Présentations

Noise exposure risk assessment and noise reduction at workplaces facilitated by the use of information technology achievements

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Summary

A new tool, NoiseSurf®, has been invented to facilitate risk assessment and noise reduction at workplaces. All information from the noise sources with sound signals, which can be listened to, photos, description of noise mitigation measure and the noise levels in different workplaces can easily be accessed in a web interface together with target levels, action values and limit values for noise exposure. Worker information and training can be provided with the interactive CD "Ljud and oljud" published by Prevent and made in cooperation with ÅF-Ingemansson in Sweden.

Résumé

NoiseSurf® est un nouvel outil développé pour faciliter l'évaluation des risques et le contrôle du bruit au travail. Il se compose d'une interface web qui permet d'accéder facilement à des contenus multimédia. On y trouve des données sur les sources de bruit et les signaux sonores (certaines sous forme de fichiers audio), des photos et des descriptions de mesures de réduction du bruit sur différents lieux de travail, et des informations sur les niveaux-cibles, les valeurs d'action, et les valeurs limites d'exposition au bruit. L'information et la formation des travailleurs peuvent se faire à l'aide du CD-rom interactif « Ljud and oljud » publié par Prevent et réalisé en coopération avec ÅF-Ingemansson en Suède.



European union directive related to exposure of sound at the workplace was published in 2003 [1]. It is addressed by the EU commission to the member states. The directive is a part of a series of physical agents directives. Three other directives have been published for the physical agents "vibration", "artificial optical radiation" and "electromagnetic fields". The purpose of the directives is the introduction of measures to encourage improvements in the safety and health of workers at work.

The EU directive on the physical agent noise in work places has lead to a new version of the regulation on noise by Arbetsmiljöverket in Sweden, [2]. In the autumn 2005, Arbetsmiljöverket had a campaign in which they inspected 1 700 companies. Their conclusion was that three of four inspected companies had not done what they should have done according to the regulation, [3]. Many companies are taking the new regulation seriously and are making programs for noise reduction to come below the lower exposure action value 80 dBA. At ÅF-Ingemansson we have noted an increased demand for services in noise exposure risk assessment and noise control plans. The turn-over in this service area increased with 50 % from 2005 to 2006.

NoiseSurf®

A new tool have been invented to facilitate risk assessment and noise reduction.

According to the directive, the employer shall assess, and if necessary, measure the levels of noise to which workers are exposed. As a part of the risk assessment, the noise exposure levels shall be compared to the action and limit values. Another obligation of the employer is to ensure that workers who are exposed to noise at work at or above the lower exposure action values, and their representatives, receive information and training relating to risks resulting from exposure to noise. Instead of presenting this information in written documents in paper copies, the noise exposure levels can be easily accessed in a web interface on a computer by all employed personnel. NoiseSurf® has been made for this purpose ; see an example in Figure 1.

Clicking on one of the triangles in the noise contour plots leads to the sound source data information ("källdata") in the upper right corner of the webpage. The source data includes the coordinates for the source, an identification number, the name and a link to a data sheet. In this case

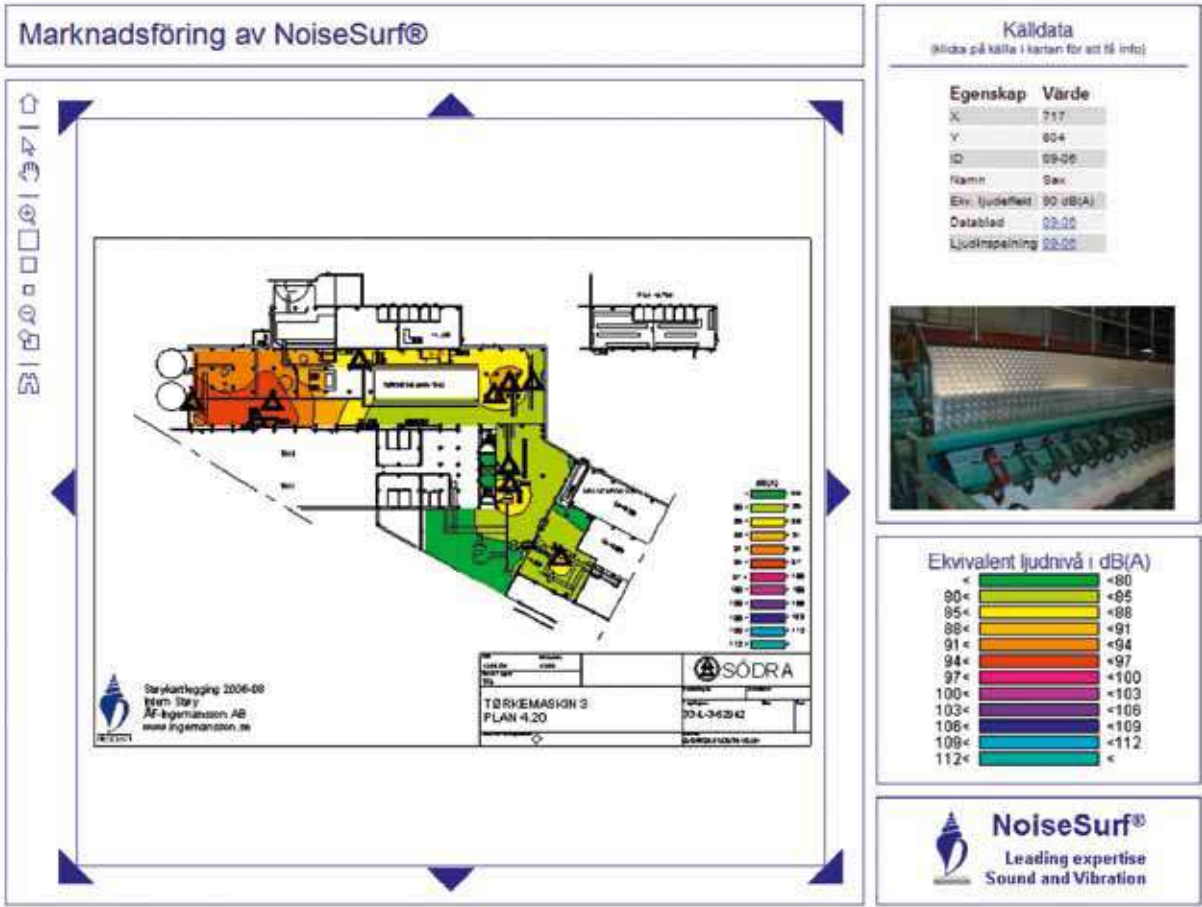


Fig. 1: Overview of a NoiseSurf® web page with a noise contour plot showing the noise levels at one of the floor levels of a paper pulp drying machine and information on one of the machines at that level

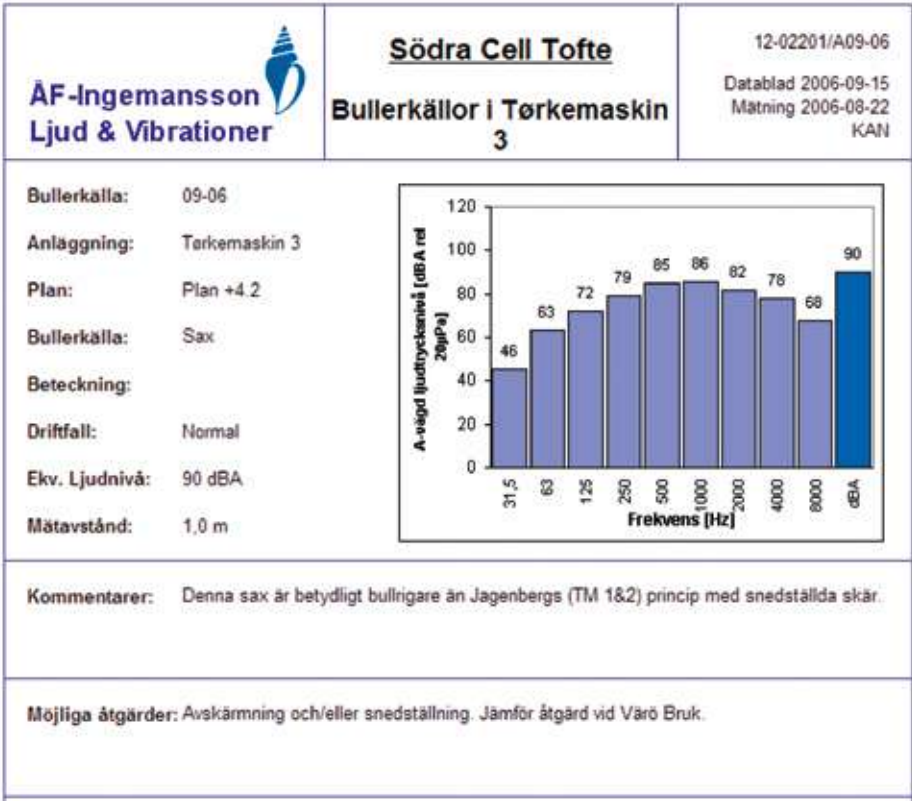


Fig. 2a : The upper part of the data sheet for the machine accessed by a link in Figure 1

there is also a link to a recorded sound signal. The machine can be listened to by clicking on the link. It is possible to include signals for the sound of the machine before and after actions to reduce the noise have been performed. The data sheet of this machine can be seen in Figures 2a and 2b.

Information is given on the machine and the sound pressure level measurement. Both the A-weighted equivalent level and the A-weighted octave band levels are presented. In the Comment field ("Kommentar") information on this machine compared to other similar machines is given. Possible noise mitigation measures ("Möjliga åtgärder") is also stated



Fig. 2b : The lower part of the data sheet for the machine accessed by a link in Figure 1 shows a photograph of the machine

From the main page of the NoiseSurf® noise survey data presentation, all departments and workshops can be accessed. There is also a link to the ordinary report, with the result of personal noise exposure measurements compared to action and limit values. Some educational material on principles for noise reduction is available at the link "Principer för bullerbekämpning".

Interactive training on noise and measures against noise at the workplace

An important task for employers at companies with noise exposure levels at or above the lower action values is to provide training on risks of noise exposure. Prevent, which is an organization owned by Swedish employers and employee organizations, has published an interactive training tool program distributed on a CD based on a manuscript made by ÅF-Ingemansson. The tool is called "Ljud och oljud", which means "Sound and noise" and is made in the Swedish language.

The tool is the first complete tool to create a good sound environment in all types of workplaces. It was produced with the purpose to aid employers and personnel all the way from the identification of sound as annoying, interfering or hearing damaging to the reduction of noise. It can be used by those who want to learn more, to choose noise mitigation measures, to hire a consultant, to buy new machines or rebuild their premises. It has two levels, one for non-specialists in companies and one for experts-to-be. There are more than 150 examples of how noise problems have been solved in different types of workplaces.

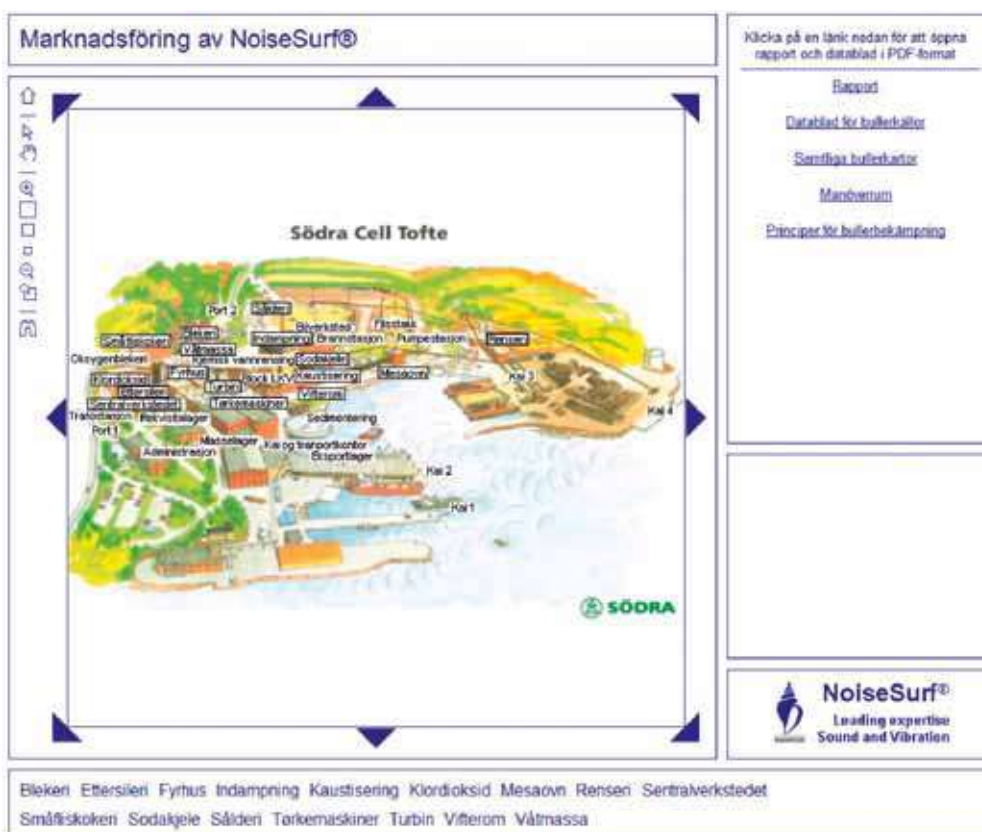


Fig. 3 : The main NoiseSurf® page

The tool has nine chapters :

1. Introduction
2. Sound and noise. The foundations of acoustics
3. Adverse effects of noise
4. Methods for noise control
5. Noise requirements from authorities
6. Noise measurement
7. Systematic noise control
8. Noise issues in new and rebuilding projects
9. Purchase specifications for noisy equipment

Two examples from “Ljud och oljud” are shown in figure 4 and 5.

Demonstration

The NoiseSurf® presentation and the “Ljud och oljud” interactive training will be demonstrated at the conference.

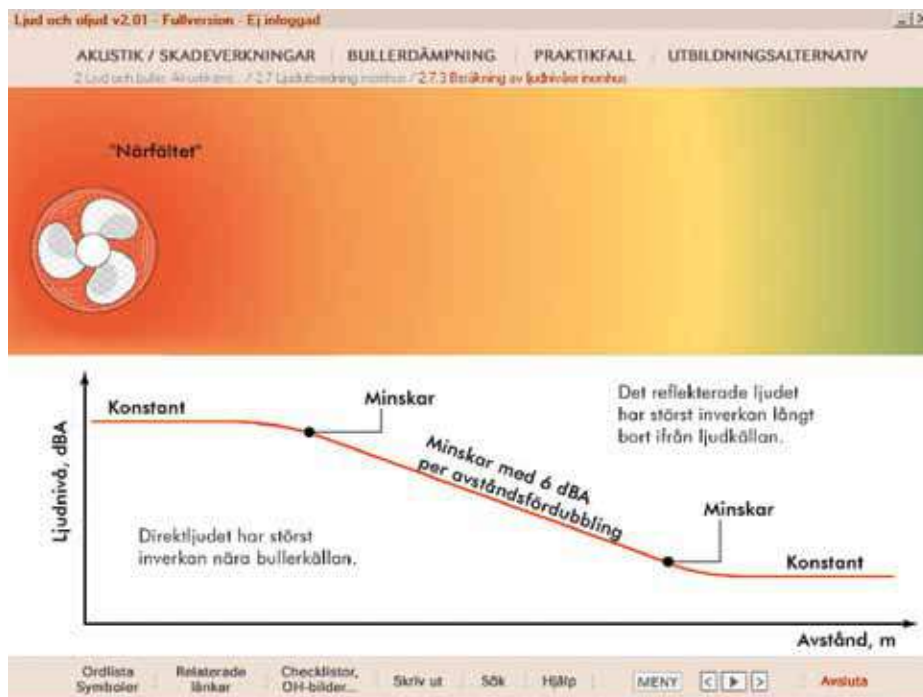


Fig. 4 (from [4]) : Example from “Ljud och oljud” showing and explaining the decay with distance of the indoor sound pressure level

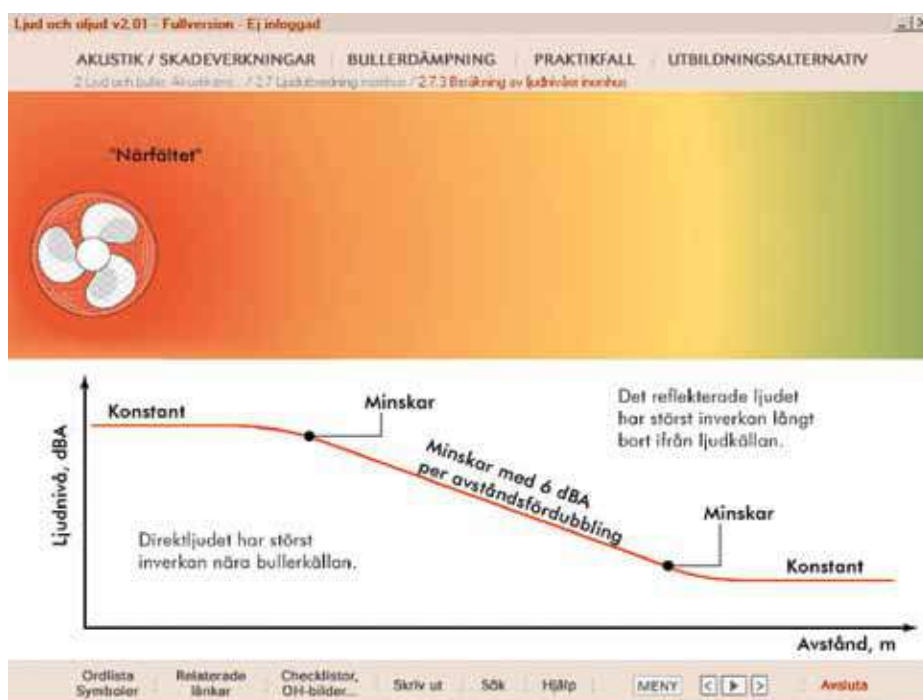


Fig. 5 (from [4]) : Example from “Ljud och oljud” illustrating that sound requirements for premises like offices, schools and nursing homes must be specified for sound insulation, impact noise, reverberation, traffic noise and noise from installations

Conclusions

Companies can present the information of a noise survey easy accessible to their employees in the intranet and to authorities on the extranet and keep record of improvements. Information layers can be added with follow up on noise mitigation measures.

In Sweden an interactive training tool "Ljud och ljud" has been developed. Using this tool will facilitate the noise control actions made at a company.

Acknowledgement

The permission from Södra Cell Tofte in Norway to present data from their noise survey is gratefully acknowledged.

Bibliography

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