

## **THE PIMEX METHOD — COMMUNICATION BY VISUALISATION: BRINGING THE MESSAGE ACROSS BY VISUALIZING WORKPLACE HAZARDS**

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A new culture of prevention is coming up. KOHS PIMEX-method (Picture-Mix-EXposure) visualizes workplace hazards and is one of the most powerful tools for improving communication of health and safety issues. The KOHS PIMEX method provides collected information about the individual workplace, KOHS PIMEX produces, stores and disseminates knowledge (Hjortsberg, Karlsson, 1995; Rosen, Andersson, Juringe, 1990).

**KEYWORDS:** PIMEX, workplace analysis, exposure assessment, knowledge management, participation

The PIMEX-method (Picture-Mix-EXposure) involves measurement of exposure with a direct-reading instrument and visualizes different kinds of workplace hazards. The signal from the instrument is superimposed to the recording from a video camera to produce a video film which continuously shows the subject at work and how exposure (e.g. dust, noise, heat, vibration etc.) varies. Application can be a physical factor such as vibration (Hjortsberg, Karlsson, 1995). Physiological information, e.g. heart rate, respiration or temperature, can be measured and displayed synchronically. The working-activity can be displayed in relation to the measured expositions and the physiological data.

The KOHS PIMEX System is an innovative approach to the PIMEX method. The technical solution is based on many years of methodological research of KOHS in cooperation with the AUVA (Austrian safety and health insurance institute). The PIMEX method has been used successfully to improve working situations for many years. Rosen & Lundstrom (1987) regard PIMEX as a very effective tool to improve working-conditions: PIMEX is intended to serve as an aid in the evaluation of various measures for reducing the exposure and in connection with the training of personnel performing work involving exposure. The method has been tried out for air pollutants in seven different cases where exposure to organic solvents, carbon monoxide, wood dust and fume from welding occurred. The result, in the form of a film, showed with great clarity what working operations were critical with regard to the current exposure. In one plant where the method was used in connection with spray-painting, a study was undertaken in order to see how the exposure could be reduced by simple measures. The results showed that the exposure was reduced drastically. Rosen & Lundstrom (1987)

say, that this method is usable for air pollutants and also for many other measurable environmental factors.

KOHS — kvieci occupational health solutions performs research and development with the AUVA since 1997. The AUVA supports and uses PIMEX in difficult and complex situations, when severe negative effects on employees' health are expected. The work-safety and health-experts of the AUVA are very convinced of the PIMEX-method, since many technical innovations and improvements of the system have been realized in the last years.

### **IDENTIFIED SUCCESS CRITERIA**

The success of the PIMEX method depends on several criterions in comparison with traditional measurements:

- visualisation
- real-time-display of measurment data
- real-time-recording (documentation, quality management)
- identifying technical details such as peak exposures or quality of exhaust
- participation of workers
- simultaneous discussion with health and safety experts
- simultaneous education and instruction of workers
- evaluation of long term improvement programs

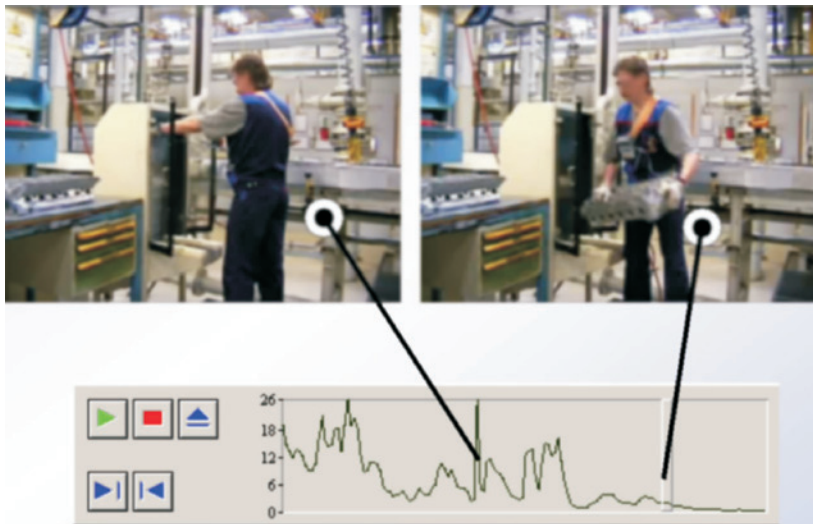
### **VISUALIZATION? WHAT FOR?**

Using the PIMEX method for improving workplace situations always brings up a lot of questions. One of the first questions is: "What for do I need visualization?". There are several aspects, where PIMEX can produce benefit:

1. technological view: analysis of workplace
2. organizational view: process design
3. personal view: participation

### **TECHNOLOGICAL VIEW: ANALYSIS OF WORKPLACE**

The primary function of the PIMEX method is analysing workplace situations, trying to identify reasons of workplace hazards. To which extent the worker is exposed to specific loads depends on several conditions. For example the configuration of an exhaust may influence the exposure rate as well as the position of the worker, the exhaust and the source of a dangerous substance. Visualizing a working situation with PIMEX means capturing measurement data of the hazardous substance at the same time as the video sequence of the worker. Analysing a working situation makes it possible to identify exactly to which part of the working process a high peak belongs to.



**ORGANISATIONAL VIEW: PROCESS DESIGN**

Today a worker is exposed to a great variety of loads and strains. To create healthy workplaces a continuous workplace improvement process based on an integrated safety and health management should be implemented. The KOHS PIMEX system helps improving the quality of workplace improvement in every important part of process design.



**PERSONAL VIEW: PARTICIPATION**

One of the most important elements of the PIMEX-method is their worker’s participation. Employees are the experts of their own workplace. Often employees have the best ideas

for the improvement of their working situation. With PIMEX they can observe their working-conditions and the correlation between their behavior and the intensity of workplace-hazards. Then they can contribute their proposals for the feasible improvements of the working-situation.

PIMEX offers the possibility to integrate the employees into the workplace-improvement-process. By visualizing the workplace hazards, a KOHS PIMEX observation is available for analysis just after recording. The PIMEX observation can be presented to the worker immediately, expositions-peaks can be viewed and discussed, causalities can be identified, measures can be chosen together. In fact, if the worker was involved in the choice of the measures, he will accept and support the implementation of these measures.

### **WHAT CAN THE KOHS PIMEX-SYSTEM MEASURE?**

The traditional focus of PIMEX is measuring chemical hazards and handling medical data. Additionally it is possible to measure any kind of hazard, where compatible direct reading instruments or sensors are available.

### **ASSESSMENT OF LOADS IN BREATHING AIR**

During a PIMEX intervention at VAE Eisenbahnsysteme the dust-concentration in frog grinding cabins should be measured. Frog grinding demands much power and precision from workers, and produces dust in the breathing air of the whole plant. One target was the improvement of the dust capture, the other target was to reduce the ambient dust levels in the plant. The PIMEX-method should show, if a new exhaust-installation was necessary and where it could bring up the best results.

The analysis with the PIMEX-method brought a comprehensive assessment of the situation and showed, that a new exhaust was necessary. "The PIMEX-method does not only help to improve occupational safety and health, but also delivers economically interesting information. We could see, that the new exhaust-installation for 100.000 € brought reasonable benefit."

### **TECHNOLOGICAL BACKGROUND OF THE KOHS PIMEX-SYSTEM: THE 5 ELEMENTS**

To perform PIMEX-observations you need the following 5 elements of technical equipment: direct reading instruments (element 1) collect the data and sends the data to the kohs.bluelog datalogger (element 2), which is a special datalogger developed for the use of PIMEX. The kohs.bluelog datalogger is a very small, non invasive device for wireless and stable data transfer to the main system, which is a notebook (element 3). At the same time the data is transferred, the video signal from a digital video-camera (element 4) is captured by the KOHS PIMEX software (element 5). The KOHS PIMEX software handles the synchronization of measurement data and the video signal.

## **TO BRING THE MESSAGE ACROSS**

PIMEX makes hazards visible. Relations between the working-situation, behaviour and the exposition can be visualized. At the one hand workers can be sensibilized to think about correlations between their behavior and loads. At the other hand the management gets transparent information and documentation of workplace hazards and the improvement of working-conditions.

The European Agency for Safety and Health identified the PIMEX-method as one of the most efficient approaches to bring knowledge about health and safety across.

One of the base ideas of PIMEX was to transport the message of how to develop healthy workplaces. Using a PIMEX video sequence is a very effective way to teach workers about safety and health issues. (Hjortsberg, Karlsson, 1995; Rosen, Andersson, Juringe, 1990). The KOHS PIMEX method provides the technological infrastructure to build an individual knowledge management environment. In fact PIMEX is a highly potential tool for creating, storing and disseminating information and knowledge about safety and health aspects.

Every PIMEX observations represents knowledge, we need to better keep and disseminate it. A lot of working situations could be improved if information about good practice could be better transferred to the companies. With PIMEX and new technology of knowledge management this could be achieved.

## **OCCUPATIONAL SAFETY & HEALTH MANAGEMENT**

PIMEX is a good solution to combine workplace health promotion strategies and optimisation of working processes to raise productivity. Companies attention should be drawn to holistic management of workplaces.

Participation is a very important aspect of health promotion in general, of occupational health management in particular and a key element within the PIMEX method.

## **LITERATURE**

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