

Workers' Active Involvement in the Improvement of Occupational Safety and Health in a Textile Enterprise—A Case Study

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Part of the Polish-Swedish OSHMAN project was carried out in a textile company. It aimed at implementing and improving effective health and safety management with workers' active involvement at all levels of the enterprise. The two main problems to be solved during the project were decreasing occupational risk and improving workers' poor knowledge on occupational risk. Training courses, workshops and practical activities were undertaken. As expected, there were changes in work organisation and improvement in the way workstations were looked after, which led to a decrease in occupational risk. Workers were highly committed during the project. Nevertheless it seems that more training should be directed at middle management.

safety management worker's involvement occupational risk

1. INTRODUCTION

Awareness of the need to implement, maintain and improve a system of occupational health and safety management has recently increased among Polish entrepreneurs. However, there is still room for improvement.

An effectively working system must be based on two elements: firstly, all activities aimed at improving the state of occupational safety and health (OSH) have to be supported by the enterprise's top management. Secondly, workers from all levels of the enterprise's organisational structure have to be involved and actively participate in the creation and, later, in a constant improvement of the system. As the experience of other enterprises shows, a system of safety management may have no influence on

an increase in the level of safety in an enterprise if it exists on paper only. A system should aim at forming a positive safety culture based on workers' proper education and participation, and an effective system of communication.

The fact that at the basic and middle (and sometimes even top) levels of the enterprise there is often hardly any awareness of the need for safety management is a considerable obstacle in the implementation of a system which would involve all workers. Furthermore, they are also unaware that every worker can, and in fact should, influence the operation of the system. The importance of the conclusions presented here has been stressed in numerous publications on OSH management (e.g., [1, 2, 3]). Psychologists and organisation theoreticians also stress the importance of workers'

participation not only in the increase in their commitment and motivation in the improvement of safety at work, but also in heightened work satisfaction [4, 5, 6].

This article presents the process of implementing elements of a system of OSH management in Polish enterprises, using Teofilów S.A. (Teofilów, Poland) as a case study. This process proves it is possible to involve workers from all levels of the organisational hierarchy and visible effects can be achieved.

1.2. The OSHMAN Project

Teofilów was one of five Polish enterprises which took part in the Polish-Swedish OSHMAN (Occupational Safety and Health Management) project in Polish industry [7]. The project ran between 1999 and 2001 and was financed, on the Polish side (the Central Institute for Labour Protection), from funds allocated from the National Strategic Programme “Safety and health protection of man in the working environment”. On the Swedish side it was financed by the Swedish International Development Cooperation Agency (Sida) for the participation of consultants from NIWL (National Institute for Working Life) and from IFA and Styrman, Swedish consulting companies.

The aim of the project was to support the implementation and the improvement of the effectiveness of OSH management in selected enterprises. Furthermore, an increase in top management’s involvement and the strengthening of their awareness of their responsibility for safety in the enterprise was to be achieved. Close co-operation with employees at the basic level was assumed, in order to best involve them in creating and maintaining an occupational safety and health management system (OSH MS) in their enterprise.

The project had four stages:

- preparation for the implementation of the project. This stage included, among others, visiting the enterprises and gathering data concerning the state of occupational safety and health management in them, along with

choosing problems to be solved during the running of the project;

- training enterprises’ representatives, planning detailed tasks, aiming at the improvement of the state of safety management in the enterprises, also appointing workgroups and programmes of action;
- implementation of elements of OSH management and assessment of the results of activities undertaken in the enterprises,
- documentation and dissemination of the results of the project.

1.3. Teofilów

Teofilów, a textile and clothing plant, has been a single-plant State Treasury-owned joint-stock company since 1999. During the project it had around 500 employees. At present the enterprise is mainly involved in manufacturing knitted goods made of cotton, polyester and mixed yarn, as well as dyeing, printing and finishing. The textiles are used in the production of underwear, clothes and bed linen. Goods manufactured by the company are sold both in Poland and abroad.

Before joining the OSHMAN project the enterprise had already implemented some elements of OSH management and the people responsible for OSH were highly aware of and involved in this field.

2. IMPLEMENTATION OF THE OSHMAN PROJECT

2.2. Identifying Objectives of the Project

The implementation of the project began with identifying problems connected with the operation of the OSHMS in the enterprise and recognising the most important hazards in individual departments: internal transportation safety, working conditions in the dye kitchen (the place where mixtures of dyes are prepared and which houses machines used in the initial stage of textile dyeing)—among them the occurrence of factors harmful to health (dust, toxic substances)—and the question of whether workers followed the OSH provisions and principles.

According to the enterprise representatives, the following fields related to OSH management needed to be worked on: the documentation of inspections in the area of OSH, the involvement of workers in the process of improving of working conditions—by means of submitting observations and proposals to the plant management, the monitoring of accident hazards and an increase in OSH training efficiency.

The representatives of the plant also expressed their expectations regarding the participation of the company in the OSHMAN project. These were mostly related to keeping hazards under control, the minimisation of losses, the reduction of work accident hazards and the increase of workers' involvement in the constant improvement of the state of safety in the enterprise.

2.3. Programme Implementation

The representatives of the plant and the external consultants identified two main objectives, which were to guide the project activities at the company. These objectives were connected with the two selected problems:

- the “technical” problem, i.e., the lowering of occupational risk at workstations in the dye kitchen department;
- the “system” problem, i.e., the development of an information system for workers regarding occupational risk at the workstations.

It was also decided that the already existing model of OSH management would be adjusted to the requirements of Polish Standard No. PN-P-18001 “Systems of occupational safety and health management. Requirements” [8]. This standard was established in 1999. It is a voluntary tool for managing OSH in a company. It is based on a continuous improvement cycle and it defines demands on the management system related to all health and safety aspects in a company (e.g., management commitment, risk assessment, communication, OSH training, accidents analysis, monitoring the work environment). Identification of the need to adjust the company's management system to Standard No. PN-P-18001 [8] was

an additional objective related to the system problem.

For each of the aforementioned objectives specific tasks were defined, including dates for commencement and completion, responsible people and required resources as well as the scope of assistance from Swedish and Polish consultants. The basic idea was to involve plant workers in as many undertaken activities as possible.

The following tasks were defined.

- Within the framework of the first objective,
 - analysis of occupational risk in the dye kitchen,
 - improvement of work organisation in the dye kitchen.
- Within the framework of the second objective,
 - identification of the needs related to an adaptation of the OSH MS existing at the plant to the requirements of the Polish Standard No. PN-N-18001 [8],
 - development and implementation of the procedure of informing workers about occupational risk,
 - training for workers regarding occupational risk,
 - preparation of information materials on occupational risk,
 - assessment of workers' awareness with respect to occupational risk.

Activities undertaken within the framework of the project were to be implemented mainly in the dye kitchen department. The representatives of the plant planned to transfer the experience from this department to other departments of the company, after the project was completed.

During the running of the project a series of workshops and training courses for employees of all levels took place. They were not only a source of theoretical information regarding the rules guiding the operating of the OSH MS; they also created an opportunity to share experience from the implementation of a system like that in Sweden.

Additionally, they also encouraged workers' active participation and their involvement in the solving of problems related to OSH. The following

issues were discussed during the workshops and training courses:

- a preliminary review and documentation of the OSH MS for company's representatives—off-site training in the Central Institute for Labour Protection (CIOP)¹,
- continuous improvement method—workshops with the participation of workers from the dye kitchen and supervisory staff,
- creation of a common platform for solving problems effectively—a seminar with the participation of representatives of middle management,
- the role of managers in the continuous improvement process—a seminar,
- information for workers on occupational risk and identification of OSH problems—workshops with the participation of the basic level employees and middle management,
- improvement of the internal customer – external supplier co-operation—workshops with the participation of basic level workers.

The box shows a description of an exercise carried out during the implementation of the programme.

A yellow Post-it® note or the identification of hazards

The exercise was held with the participation of all dye kitchen workers (9 people) who usually worked in three shifts and in groups of three. First, everybody gathered in the seminar room where the consultants gave a short lecture, concerning the role of workers in the identification of hazards (the experts in the field). They gave examples of the basic tools of the continuous improvement method, which can be used in the area of OSH. The following subjects were among those discussed: the idea of the 5S campaign (activities carried out at workstations: keeping order, systematising, cleaning, maintenance and inter-group understanding), and the so-called MUDA, which stands for all activities which do not create the added value and might only increase hazards and bring losses. Later, every worker was given a set of yellow Post-it® notes with which everybody went to the workstations in the dye kitchen department. The workers' task was to place the Post-it® notes on all objects which they deemed unnecessary, safety threatening or not fully operative. The workers were also asked to justify their choices. As a result of this activity many objects and situations were identified as unnecessary or creating potential hazard in the dye kitchen though the place itself seemed rather safe and the hazards unnoticeable. These were, for example, a broken chair nobody used; water-supplying pipes leaking in close proximity to electrical wires; barriers between workstations which made transporting chemicals difficult. After completing those activities, the workers, together with middle management and an OSH specialist, designed a plan for removing the identified hazards. Furthermore, deadlines for the completion of all tasks were established and people responsible for each of them were chosen.

¹ Now the Central Institute for Labour Protection – National Research Institute (CIOP-PIB).

3. RESULTS

3.2. Implementation of the Identified Objectives

3.2.1. *Objective No. 1: decreasing the level of occupational risk at workstations in the dye kitchen*

Implementation of the tasks related to this objective resulted in the following:

- hazards occurring at the workstations in the dye kitchen were identified. A plan to eliminate some of the hazards was designed, and later its implementation began (among others, outdated and unused chemical substances were removed, together with unused equipment kept at the department);
- chemical substances, applied in the production process, were marked;
- changes were introduced in the organisation of the workstations of workers responsible for the weighing of chemical substances. They now have easier access to currently used chemicals which renders their work safer and more comfortable;
- the net which obstructed safe transportation of chemical substances between various places in the dye kitchen was removed;
- a place, partly isolated from the workstations, was found for workers' short rest;
- workers' needs regarding personal protective equipment were analysed (particularly protective gloves, footwear and half-masks);
- occupational risk in the dye kitchen workstations were assessed.

3.2.2. *Objective No. 2: development of an information system for all workers regarding occupational risk at the workstations, as an element of the OSH management system compliant with the requirements of the PN-N-18001 standard [8]*

Implementation of the tasks related to this objective resulted in the following:

- training was organised for plant workers, regarding the interpretation of the requirements of the Polish PN-N-18001 standard [8] and of the implementation of an OSH MS compliant with this standard;
- a plan was devised to adapt the OSH MS existing at the plant to the requirements of the PN-N-18001 standard;
- a board was posted in the dye kitchen containing, among others, a list prepared by the workers of hazards at the workstations in their department;
- a plan was approved by the workers and middle management for meetings at the working positions;
- a model discussion of problems related to OSH was held, as an example of what might happen during future meetings;
- an in-house bulletin "Occupational Safety Management" was designed and printed, presenting the results of occupational risk assessment for the dye kitchen workstations.

3.3. Monitoring of Safety Climate

During the implementation of the programme a survey was conducted twice, aiming at monitoring the changes in the workers' perception of safety climate at the plant. The study was based on the Zohar's [9] conception of safety climate. It was also assumed that safety climate is a manifestation of the safety culture in an enterprise and the safety climate questionnaire can be used to monitor the level of safety culture during its forming and strengthening [10]. It was expected that safety climate perceived by the workers would be judged more positively after the completion of the programme compared to the assessment held in its early phase.

3.3.1. Method

A safety climate questionnaire was used for the survey [11]. The questionnaire contains 56 statements to be placed on a 5-point scale (from *I strongly disagree*, through *I disagree*, *I neither agree nor disagree*, *I agree* to *I strongly agree*). The reliability of the scale (Cronbach's alpha)

was .94 (first study) and .93 (second study). The statements are related to the following fields:

- management's attitude towards safety,
- workers' involvement,
- OSH training and analysis of accidents,
- attention paid to OSH matters at the plant,
- relations between employees,
- responsibility and awareness regarding OSH,
- safe behaviours.

Individuals results (the overall sum of points for all statements, according to the following scale: 0—*I strongly disagree*, 1—*I disagree*, 2—*I neither agree nor disagree*, 3—*I agree*, 4—*I strongly agree*) show how a given employee perceives safety climate in their enterprise. The overall mean result calculated for all employees indicates the level of safety climate in a given enterprise. It is assumed that the higher the mean result, the better the safety climate in the enterprise.

The first survey was held in an early phase of the programme implementation, in August 2000, and 57 correctly filled questionnaires were used for result analysis. The second survey took place in April 2001, 6 months after the last training organised for employees within the framework of the programme. Thirty-five questionnaires filled by workers were used in the analysis. The questionnaires were given to employees by the plant's OSH specialist and the choice of people to be surveyed in both cases was arbitrary.

3.3.2. Results

In the statistical analysis of the results a test for two independent samples was used (variance analysis, test *F*). As it had been expected, safety

climate turned out to be better in the second survey compared to the results of the first one. The results of the variance analysis show that the difference is statistically significant (Table 1). The results are also presented in Figure 1.

To present the differences obtained in a way which would enable a deeper analysis, the statements of the questionnaire which received different workers' responses in the two surveys were identified. The *T* Student test was used and the most noticeable differences (with the level of statistical significance of at least .01) were observed in the case of 14 statements. The results obtained are presented in Figure 2.

A reverse tendency was noticed for *I can always count on my co-workers help and support* (No. 14 on the graph); more employees agreed with this statement in the first survey than in the second one.

The results obtained should be viewed with a couple of restraints in mind, most of all the small number of employees who took part in both surveys, as well as the fact that the two groups of workers were different in each case. Nevertheless, the results show that, generally, the level of safety climate measured in April 2001 was higher than the one in August 2000. Yet, there still exist areas which need improvement (especially regarding workers' co-operation). The results confirm positive changes which occurred at the plant during the implementation of the OSHMAN programme, though another survey of safety climate should be held after another few months to check on the permanence of those changes.

TABLE 1. The Level of Safety Climate in Survey 1 (August 2000) and Survey 2 (April 2001) (ANOVA Variance Analysis, Test *F*).

Survey	No. of Subjects	Mean Result for All Workers	ANOVA	
			<i>F</i>	<i>p</i> *
1	57	106.81	7.325	.008
2	35	122.06		

Notes. **p*—statistical significance.

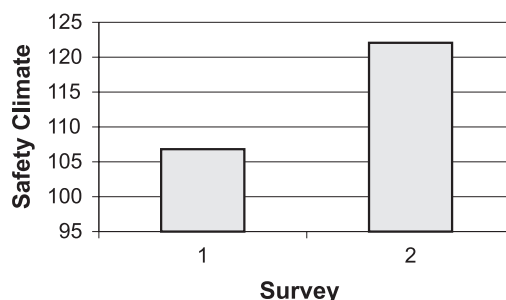


Figure 1. The level of safety climate in Survey 1 (August 2000) and Survey 2 (April 2001).

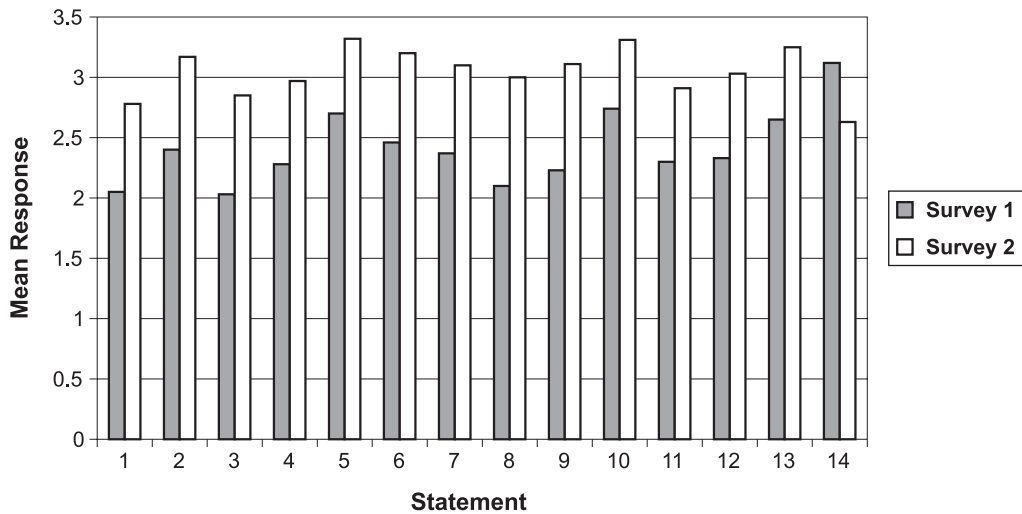


Figure 2. Workers' responses to statements in Survey 1 (August 2000) and Survey 2 (April 2001).
Notes. Responses were given on a 5-point scale: 0—I strongly disagree, 1—I disagree, 2—I neither agree nor disagree, 3—I agree, 4—I strongly agree. Numbers on the horizontal axis: 1. When accidents are discussed in meetings workers consider their causes together. 2. Every employee of the company has opportunities for improving their professional qualifications. 3. There is always time for discussing OSH during staff meetings. 4. I sometimes use equipment (machines) of which the technical state may be hazardous to my health (statement with the so-called reverse scale, in which 0 stands for I strongly agree and 4 for I strongly disagree.) 5. The management makes sure that the physical work environment is safe and harmless for workers' health. 6. I feel proud to work in my company. 7. I sometimes do not respect OSH regulations, especially when I do work which I know very well (statement with the reverse scale). 8. Personal protection equipment used by the company is modern and comfortable. 9. The relations between workers and management are characterised by mutual understanding. 10. Every employee's safety and health are very important in my company. 11. The OSH training at my work place is interesting and valuable. 12. All accidents are discussed in staff meetings. 13. The managers do not respect the OSH regulations (statement with the reverse scale). 14. I can always count on my co-workers help and support.

3.4. Additional Results of the Project

Additional results were obtained, of which the most important are

- increased knowledge and skills of workers resulting from training held at the plant. Workers, first of all in the dye kitchen, became assured that they could originate changes at their work place according to their needs and expectations. They became more active and open in presenting their own opinions, ideas and proposals (opinion of plant representatives);
- better communication between workers from different departments and shifts (during workshops and training workers met people who on an everyday basis they rarely have an opportunity to talk to);
- better understanding between workers and middle management. Discussions held during training made it possible to solve several disputed questions, for example the problem

of cards on which workers record the time for particular operations. The workers considered them useless and obstructing work as well as directed against them (excessive surveillance).

The manager explained the intentions behind such cards (possibility to follow production process). Consent was reached and a conclusion drawn that the real problem in this case was the lack of adequate information regarding the purpose of such cards;

- workers' integration—meetings, organised during the implementation of the project, allowed the workers from various levels to confront each other, to exchange their views, discuss problems and to examine their solutions together. Workers were not afraid to talk about negative aspects of work conditions and organisation and of interpersonal relations, not only between employees from the same level, but also between them and their superiors.

Questions such as admitting mistakes and mutual trust were discussed together;

- workers' increased awareness regarding their ability to identify hazards and means of protection against them. Workers are more aware that, because it is them who know their work best, they are the experts as far as hazards at their workstations are concerned. They are also more assured that methods of work that they have assumed (keeping the work place clean and orderly, reporting the hazards noticed, talking to each other about problems occurring) will be directly related to risk level at the workstations.

The representatives of the company themselves asserted that as a result of the training held within the framework of the project they expanded their knowledge which would guarantee effective management and surveillance of OSH matters at the plant. The OSHMAN project allowed them to acquire practical skills in the area of identification of hazards and occupational risk assessment, continuous improvement of the OSH MS, as well as involvement of all employees in the functioning of this system [7].

In the opinion of CIOP experts, the programme's success was the result of, among others, co-operation with the plant, consisting of support and help of external consultants, who acted as moderators and gave people from the company independence in taking actions, making them the main actors during the implementation of changes in their company. Not without importance was also the adjustment of all planned actions to the specificity of production and the then situation in the company (before developing the plan and defining the objectives CIOP learned in detail about the company's situation concerning OSH, as well as about the needs, expectations and abilities of the plant in this field).

The Swedish consultants stressed that so many positive results could be obtained primarily thanks to the attitude of the plant's representatives (the OSH specialists). Despite their initial doubt and carefulness, during the course of the programme they were open, eager to introduce changes and generally enthusiastic about the whole project. Also, not only the top management showed a

positive attitude towards the OSHMAN project, so did the blue-collar workers. This may be exemplified by the fact that workers took active part in weekend training on Continuous Improvement without extra pay. Middle management was the last to accept the ideas conveyed by the OSHMAN project: they only did it towards the end of the programme.

4. CONCLUSION

An effective implementation of the OSHMAN project at the textile plant was possible first and foremost thanks to the dedication of people who took part in the programme, among them the external consultants, plant representatives, as well as other workers who, at their workstations, directly put consultants' suggestions into practice. This article gives little information about the difficulties or failures in the implementation of individual stages of the programme. It seems that this results from the realistic attitude of plant representatives who, during the defining of project objectives, did not allow objectives which would not be possible to implement. Some disappointment may be felt as far as the involvement of middle management is concerned, which might suggest that more training should be directed towards this specific group of employees. Whether positive changes introduced during the project implementation will be consistently maintained in the future depends to a great extent on middle management.

The workshops and training held included practical exercises, and the tools and methods of co-operation devised together with the employees can be successfully used for any future problems occurring in the field of OSH. However, it is very important that the knowledge and experience acquired by the workers who took part in the training should be disseminated among other employees of the company.

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