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NEW WAYS OF MANAGING PREVENTION - A CULTURAL AND PARTICIPATIVE APPROACH

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ABSTRACT

An action research on accident prevention has been carried out in two Danish manufacturing companies. The perspective has been to consider the barriers and possibilities of improving accident prevention in practice. Prior to introducing a new preventive program, safety culture and organization was studied. The approach to safety culture is ethnographic, drawing on an interpretive and symbolic conception of organizational culture. Confronted with a multiple set of cultures, which had hitherto impeded preventive activities, the action research part introduced preventive programs and methods aiming at learning, seen as a socio cultural process. This meant participation of untraditional groups in risk analysis and prevention activities. In this endeavour, new preventive tools were applied. It is concluded, that barriers to prevention seem to be limited workers' involvement as well as cultures toned by behaviour control, blame or expert orientation. Whereas cultures, embedding at least some common understandings, combined with organizational structures, characterized by a less marked division of labour and by workers' participation, seem to support efforts of setting a new agenda on accident prevention.

INTRODUCTION

Despite of more than twenty years of enforcing the Danish Work Environment Act and empowering a number of institutions, the rate of occupational accidents in Denmark has not been reduced. Several factors can explain this disappointing status. The maintained accident rate could, among other things, be explained by the lack effective methods of accident prevention appropriated to Danish workplaces. Whereas research on occupational accidents in other Scandinavian countries in the same period has developed such methods, we have in Denmark turned the efforts concerning work environment in other directions. Thus, up-dated knowledge on occupational accidents has been has been rather sparse in this country.

This scenario has, however, changed somewhat in recent years. In a governmental strategy on work environment in Denmark, accident prevention has been pointed out as one of 4 areas needing intensified consideration.

This paper communicates results of a study (Richter 2001), aimed at throwing light upon how accidents could be prevented more effectively. Initially some key theories on accidents, leading to different strategies of accident prevention (Kamp & Koch 1998), are outlined. Drawing on the ongoing discourse on safety culture (Guldenmund 2000), it is argued, that attention to safety culture could contribute to a deeper understanding of appropriate accident prevention approaches. From this outset, new preventive strategies, oriented at supporting learning in the organizations (Pidgeon 1998), are considered. Cultural change is conceived as an on-going result of learning processes. Case material from two medium size Danish production companies is then presented. This includes introducing participative risk analysis tools,

appropriate in the specific organizational and cultural setting. A central question is, how could local competences in handling prevention be developed, and which barriers or potentials may exist? This is finally discussed, as illustrated by the cases.

From safety management to safety culture

At present there exists a general agreement on the limitation of understanding accidents from a merely technical -or human error perspective. The interaction between technical and social aspects within an organization has been given growing attention in efforts to build up a deeper understanding of the causes of accidents. During the past decade such discourses of effective accident prevention have shed a growing emphasis on Safety Management.

Safety management is, however, a broad concept, embedding different understandings of prevention strategies. In the Scandinavian countries a widespread conception of safety management draws on the deviation control model (Kjellén 1984, Backström 1996). This model views the enterprise as a system, which is under control in the ideal condition. Accidents are caused by deviations from the ideal condition, and incidents occur because of deviations from norms and rules. Within the safety management model attention is not only on risks, but also on daily production routines, the safety organization and general management systems. Effective accident prevention should optimize and take all of this into account.

Recommendations adhering to this model of safety management are oriented towards the total organization of accident prevention activities, and not merely towards human behaviour and technical systems. The concept of organization – and human behaviour – is, however, rather mechanistic and rationalistic. There is an assumption of the existence of a stabile and normal state of affairs, which could be described and formalized. Elements of coincidence and contradictions characterizing organizations as well, are not taken account of.

Following this line, two of the fathers of the deviation control model (Kjellen & Hovden 1993) – who have thoroughly investigated 6 companies, applying this model - conclude, that the model is not as effective as expected. Even though the explicit goal was to improve the companies' ability to conduct broader investigations on accidents, the focus was still narrowed down to human and technical errors. Kjellen and Hovden also observed, that data on risks and accidents, collected by the safety organization, mirrored the organization's own understanding and motivation rather than the real and existing risks within the companies. This was described as "filters", reflecting that actors conceive accidents in specific ways, thus becoming blind towards certain aspects. These observations are in line with others (Turner 1992, Hale & Hovden 1998, Pidgeon 1998, 2000), who point at the impact of cultural elements. Taking account of culture has been recognized as central to efforts to reduce accident rates. Safety culture has, subsequently, become an important paradigm in accident research since the 1990'ies. Thus, focus has shifted from deviations towards the "normalized".

Safety culture and learning

The concept of safety culture is in some contexts applied prescriptively in a discussion of the markings of "good" and "bad" safety cultures (Reason 1998, Mearns et al 1998). However, we have in the present study primarily applied the concept of safety culture analytically in an effort to understand how companies handle risks and accidents and how prevention could be organized.

In the approach to safety culture we have been drawing on theories of organizational culture within an interpretive and symbolic conceptualization (Alvesson 2001, Parker 2000). Focus is on symbols, expressed verbally, physically and by actions, giving meaning to the people concerned. Furthermore, culture, in this conceptualization, concerns what happens between people; i.e., culture is shared among several people. In the process of giving meaning to safety matters, the members of the organization interact with one another, and are also drawing on earlier experiences and on impulses from outside the single company. This explains, according to Alvesson, observasions of several different cultures coexisting within an organization, typically cutting across the formal organizational structures. Conflict and ambiguity, within and among the cultures, are also important issues. Within this frame of reference the issue of sub-culture is not discussed, since it implies that certain cultures are subordinated to another "superior" culture (Parker 2000). It is a matter of perspective, which of the cultures in a company one could define as superior.

We view safety culture as a specific aspect of organizational culture. In line with Pidgeon (1998, 2000) we define safety culture as the shared and learned meanings, experiences and interpretations, which guide people's actions and have an impact on risk, accidents and prevention. Since actors within an organization relate not only to safety, but also to production matters, work tasks, etc., safety culture must be understood in the specific work context.

As Alvesson, Pidgeon has observed, that different people and organizations are only able to hold a partial, and often changing interpretation of a specific situation. Orders given may be ambiguous, responsibilities vaguely defined and goals may shift. This may draw attention away from existing risks. Furthermore, according to Pidgeon, processes of defining risks or reporting errors can be undermined, if the possible existence of several understandings is not recognized.

With this perspective on safety culture, organizational learning related to safety issues becomes central from a preventive point of view. Learning from accidents has also been on the agenda in earlier strategies of accident prevention. But traditionally, the efforts have been concentrated on collecting data on accidents and near-misses, and on sophisticating knowledge via systematization and statistics. As discussed above, this safety management strategy contains weaknesses from the viewpoint of learning. The collection of data is, among other things, compromised by "filters" – i.e. cultures – narrowing the possibilities of learning. Studies of major accidents, as for example the Challenger accident (Vaugham 1996) show, that several warnings could be detected prior to the accident, but they were systematically unnoticed. Only retrospectively they became visible.

This pinpoints a need of throwing light upon the "blind spots" or, on aspects, which are normally taken for granted, and therefore not talked about. Acknowledging this, and paying attention to the possible existence of several interpretations on risks, we have been inspired by socio cultural perspective on learning (Cook & Yannow 1993, Elkjær 1999). Learning, in this perspective, is a combined process of socialization and of generating new experience by interaction with others. The learning processes should enable the members of the organization to reflect on their own praxis, confront different meanings and revise assumptions of the normal, the necessary, and the impossible. We learn by exchanging viewpoints and by practical experimentation. This means, learning is a process of culture change. As stated by Per Olof Berg: "A true strategic change program does not impose anything, but makes people aware and illuminates certain aspects of culture in which they exist … By bringing values, principles and behaviours to the surface and providing people with a framework, with which they can interpret what they see, an emancipatory process is started." (Berg 1985:298)

Method

The presented study has combined ethnography on safety culture with a study of the organization, and then proceeded doing action research in an attempt to develop accident prevention in the participating enterprises. 3 researchers have contributed at different stages of the project.

The initial fieldwork on safety culture consisted of semi structured, ethnographic interviews (Heyl 2001) with about 25 persons out of 110–150 employees in each company – workers, managers and safety organization members, informal presence in production areas, participation at safety committee meetings and participant observation (Emerson et al 2001), when local actors conducted accident analyses. Interviews were recorded and transcribed in full text, and diaries from the researchers' participation at meetings and other encounters were kept. This was supplemented by reviewing the companies' written documentation on safety issues. All in all, the researchers were present about 30 days in each company, and were in contact with about half of the employees on safety and work related issues.

Throughout the empirical work the researchers have, on the one hand, been practicing empathy with the field, and on the other hand creating sufficient distance to the field (Heyl 2001). The first viewpoint implies being respectful of the persons and the organization in order to understand meaning, expressed by the individual, from his or hers own perspective. The second viewpoint implies being critical and self critical in order to be able to evaluate meanings and understandings from "outside".

Analysis of safety culture was conducted as an iterative process, inspired by Alvesson (1993). The process of analysis was cross-checked through further encounters in the companies, and inter-subjectively among the researchers. The analysis focused on each actor's assignment of meaning to the following objects

(Henderson 1998, Bucciarelli 1994): Risks and risk handling in practice; causes of accidents; preventive measures, implemented or necessary; safety work, participation, problem- and conflict solving; own job, mission and satisfaction issues.

Since culture is shared, we looked for integrative, common elements of understandings, but also paid attention to differentiated or ambiguous interpretations of the objects in focus. Each cognitively coherent system of meaning on the objects was summed up and defined as one culture. The criteria - for setting off one culture - was, that at least 6 persons in the company should be aligned to corresponding conceptions of the safety related objects. The analysis process revealed the existence several safety cultures in each company, which did not necessarily follow the organizational structures. The analysis also revealed both acknowledged and "hidden" – normally not talked about - experiences on risks and accidents in ways, which proved to be both recognizable and "eye opening" to the participants. Theories, method and analysis of safety culture are further documented in Richter & Koch 2003.

However, the action research part is presently up front. It encompassed meetings with project groups, participative observation and supporting change processes, in the Scandinavian tradition of action research (Gustavsson 1992, Greenwood & Levin 1998, Denzin & Lincoln 2001).

In the action research part two sets of methodological considerations have been at play; first of all organizing the change program, and secondly, choosing appropriate preventive tools. The organization of a new program of accident prevention has taken departure in the involvement of participants, who embed different safety cultures. This is an important point, since organizational learning and culture change is encouraged, when different meanings, interpretations and experiences of practice are confronted. This necessarily means involving untraditional groups, i.e. not only members of the safety organization, who could be expected to adhere to broadly similar safety cultures because of their special schooling and mission.

The Swedish ERFO method (Sundström-Frisk, 1989, 1996) of risk analysis was one of the preventive tools introduced. The method builds on the idea of everyone possessing expert knowledge on his or her own work. It also draws on observations of workers having valuable knowledge on risks occurring in the production process. The method aims at activating experiences of risky situations and conditions collectively. Since experiences and interpretations on risks may be antagonistic, an important endeavour is to establish a joint forum – a room for learning, which is free of guilt, blame and exercising of power (Bottrup 2001). It consists of three main steps: simple questionnaires on risks to workers in specific production areas, group discussions on the results, follow up sessions - including negotiations with key persons from different departments, and carrying out a plan of action on prevention in practice. In order to tone down power issues, it is recommended, that group discussions of questionnaire results are taking place among the participating workers separately. The process of managing the change program – presently the ERFO method - is headed by a group of local actors, here named the "leading group".

DESIGN OF THE PROJECT

This is a case oriented study within one large and two medium size industrial companies. The companies were drawn randomly from a list from the Danish Work Environment Authority. However, according to two main criteria: they should represent different branches of industry, and the quality of work environment should be "average" according to the Authority's assessment.

A chief executive and safety manager was initially contacted, and followed up by meetings with the safety committee of the company. Through these channels ideas, perspectives and project plans were outlined. Throughout the project the progress was described in a popular way to all employees via local personnel media.

The safety culture analysis was presented to the safety committee at the onset of the action research part. This involved dialogue with the safety committees on the existing cultures. Different new preventive tools were presented, which the researchers assessed could be appropriate to challenge the safety cultures. This was discussed with the committee members, who were also challenged to identify the participants of the change program, and to choose relevant departments, participating in the further activities.

From here, new preventive activities were going on through a period of about 5 months. After a pause of about 3 months, regarding the researchers' presence, the companies were revisited in order to evaluate the

preventive program and the gained experiences. This involved the participants in the activities and other key members of the organizations.

RESULTS

This part introduces two of the cases, and gives a short review on the safety cultures. We then proceed to present the change programs of accident prevention and the outcome.

Introduction to the enterprises

Enterprise A is a modern company with about 150 employees, producing quality packings. It is modern in respect to having successfully implemented changes of the organization during the past 10 years. Thus, the amount of layers of management is reduced, and the organization is so-called "flat". Much emphasis is laid on the independence and competence of the workers. The managers see themselves as coaches rather than controllers of the work process. The production technology is rather highly automated. Raw materials represent quite a large amount of the total production costs, and much emphasis is on wastage and quality. Furthermore, there is a marked focus on machining time.

The majority of the 90 blue collar workers are male and skilled printers and mechanics. The average seniority is about 15 years, and the enterprise has a reputation in the local area of being a good workplace.

Occupational accidents are regularly on the agenda at safety committee meetings. The safety groups investigate and follow up on all accidents. Minor technical adjustments are the main preventive measure. The general opinion is, that accidents are not a major work environment problem. They only occur once in a while. But over a 5-year span of years, quite a few workers have been injured. Overall the health and safety work is well run. There is some degree of equality in relations between management and workers, and the access to information and decisions is good. This pictures an enterprise having good preconditions of successful accident prevention, - referring to the impact of organizational factors (see for example Shannon et al 1997). But recently some serious, and almost fatal, injuries have punctured notions of everything being under control.

Enterprise B could be characterized as a rather old fashioned company with about 110 employees, producing metal parts. Company history has a major impact even today. Until the enterprise was taken over by new owners about 5 years earlier, almost nothing happened technologically. Hence, a major part of the production machinery consists of mechanical punching and drilling machines, welding apparatus, etc. The former director and first line managers conducted an authoritarian style of leadership. Wages as well as conditions of work touched the bottom. The workers' reaction to this was either to leave the company, or silence – each in an attempt establish some degree of autonomy by "drawing a ring around himself and "his" machine". Not surprisingly the enterprise had a bad reputation in the local community and in periods, the staff turnover was quite high. At the takeover a new chief executive, wanting to modernize the enterprise, entered the scene. The first line managers were replaced and reduced in number, and new policies of work were formulated. Among other things management expected more responsibility from the workers. Job rotation - to enhance flexibility and work content - was introduced with shifting success, more emphasis was put on education of the workers, and the wages were raised somewhat. More attendance to work environment was also supported by management.

The majority of the 80 blue-collar workers are male and semiskilled. A core of the workers has been in the company for many years and, on the other side, there is a group, having low seniority.

Accidents and comparative statistics are regularly on the safety committee's agenda. First line managers and technicians are primarily conducting investigations on accidents. Minor accidents are most often defined as "accidental", or explained as lapses in attention of the worker. Major accidents are often explained as a jumble of unfortunate circumstances. The general opinion on accident occurrence among workers and management is, that "we are doing quite well". Accidents are "thought away" and have become invisible in the daily production. When they do occur, they are either thought of as trivial or unique and inexplicable.

Safety cultures in Enterprise A and B

In *Enterprise A* we encountered three safety cultures. This description is limited to two of the least similar. Within one of these cultures the content of work and the production process are in focus, at the expense of safety. Meaning is given to productivity and the financial "bottom line" and, to the day-to-day satisfaction of producing good quality and mastering machinery. Risks are accepted as a condition of work, and are deemed possible to control by skillful workers. Accidents are primarily interpreted as lapses of the worker, who took risks when saving material, or wanted to get easier through the work operations. Prevention and safety measures are perceived to be counterproductive. The work of the safety groups is accepted, but not much valued, since preventive measures are typically conceived as hindrances to work.

Within another safety culture, work is perceived in the long perspective of working life. Meaning, given to work, has a perspective of mastery of one's own situation by being able to uphold work as a productive member of society throughout life. Risks and risk taking are unacceptable to "members" of this culture, and accidents are understood as counterproductive from the viewpoint of worker, company and society. Expectation concerning prevention is foremost aligned to risks, embedded in technology and the work situation. Preventive action means involvement and cooperation, and is primarily expected to be led by the safety groups. The safety groups are valued, but in some specific cases in conflict with "members" of the first mentioned culture.

Among blue-collar workers in Enterprise A each safety culture is crudely following the organizational division, i.e. department and trade, although there are exceptions. The safety cultures are replicated, unevenly, among the first line managers. Among top management, corresponding safety cultures are found, but more ambiguous, depending on the specific context.

In *Enterprise B* four safety cultures were encountered. Below, three of the cultures are described. Within one of the cultures risks are conceived connected to workers' risk taking. Accidents are explained by worker's handling the production system incorrectly, or by breaking safety rules. The question of guilt is incorporated in this conception. Understandings on prevention are oriented towards controlling the behaviour of the workers and keeping an eye on deviations from procedures. In utmost cases sanctions, such as dismissal, setting an example to others, are deemed valuable preventively. Within this culture the safety groups are primarily expected to carry out the role of "policemen" towards their colleagues.

Within the second safety culture risks are understood as connected to technical failures, i.e. if the machines are assessed safe by the technicians, accidents should not occur. Interpretations on the safety criteria align to legality, according to the Machine Directive or the Work Environment Act. Accidents are interpreted as caused by technical errors, and due to omissions among technicians. Prevention challenges technicians, who expect and are expected to be able to weigh technical safety criteria against productions costs. Prevention is understood as a question of technical expertise. Subsequently, members of this culture do not much value the safety groups. They are only formally necessary, according to the Work Environment Act. Thus, members of this culture do not expect the safety groups to involve in, for example, accident investigations.

Within the third safety culture the understanding of risks is connected to procedures and conditions of work. Accidents are explained by a variety of causes. Conceptions on prevention align to dialogue on experiences of risks, and to cooperation and making compromises. Furthermore, these understandings are linked to conceptions of the "modern enterprise". Within this culture, expectations are, that the safety groups should engage in these activities, which they also do, sporadically, in some areas of production.

The safety cultures in Enterprise B cut across the organizational structures, as more or less in Enterprise A. In top management the first and the third cultures are primarily found. Among blue-collar workers with a long seniority, some first line managers, senior members of the safety groups and technicians, the first and the second safety culture are most manifest. Workers with a shorter seniority, some safety representatives and first line managers primarily align to the third safety culture.

Organizing the change program of accident prevention

Below, we focus on the tasks of managing the new program of accident prevention, and the process connected to the approach.

Enterprise A

The safety committee was active in the initial dialogue on safety cultures and organizing the new program of accident prevention. Two departments, having lately experienced some serious accidents, were chosen to participate. Because of different domination of safety cultures in these departments, two different preventive tools were introduced. The following description is limited to one department.

In this department the 20 employees are mechanics, working at automated production lines. The dominating safety culture is the one marked by emphasis on producing quality and mastering machinery, accepting risks as a basic precondition. - Albeit the more preventively oriented safety culture was also present, among others, within the department's safety group.

The safety committee decided to involve the safety group and two workers from the production line in leading the preventive activities. Initially problems of setting time off to engage all the workers were negotiated between management, safety representative and shop steward. This was in line with traditions in this company of participation in problem solving.

The task, as formulated by the safety committee at the outset, was to challenge interpretations on risks and safety, and to focus on training programs on safe work habits for new employees. As we shall see in the following this focus widened later on in the process.

Enterprise B

As in Enterprise A we started out discussing safety cultures and new strategies of prevention with the safety committee, where the new, progressive chief executive played an active role. In general the members found, that the existing safety cultures reflected the history of the company, and that they appeared rather "locked". Some members noted, that each safety culture seemed meaningful from the point of view of reducing accident rates, but the challenge would be to "build a bridge".

So, the safety committee recommended involving the entire production area. The chief executive suggested that he, the safety officer and later on an employee from accounting, should lead the new preventive activities. This was approved by the safety committee.

The task, formulated by the chief executive, was to focus on learning and participation, seen as the key to reduce accident rates. Following this in praxis was, however, not an easy task.

Applying a new accident prevention tool

Now, we turn to experiences of applying the ERFO risk analysis method, and end up outlining participants' evaluations.

Enterprise A

Surprisingly to the leading group, almost all the workers answered the anonymous questionnaires on risks at the productions lines. The results were given to all the participants, prior to the group discussions. Group discussions among the blue-collar workers were very lively, and sometimes hard. Many views concerned, whether certain operations were risky, whether or not to stop machinery during corrections, how the technical and organizational systems could be improved. As a participant concluded:

> "We normally never discuss these matters in such a manner…. It was surprising to learn, that we all do things differently, and that machinery in some cases could be stopped without problems …"

In a following session the leading group summed up the key points and gave priority to preventive measures. These included minor technical improvements to be handled within the department, major technical improvements to be negotiated with others, and organization of production, which called for cooperation with other departments. Finally, safety problems, which could not be solved by such interventions, were handled by setting up a flexible set of rules and procedures for work operations. These procedures were integrated in the quality system, which new as well as senior employees were obliged to study and to follow in practice. After a minor conflict with the quality department, it was decided, that the safety group was responsible of revising safety procedures in the quality system, when it was called for, in case of production changes.

Enterprise B

In this company the leading group decided not to use questionnaires on risks, because of partly functional illiteracy among some of the blue-collar workers. Instead, a worker from accounting, who had formerly been a blue-collar worker, interviewed the workers. This was done using an open set of about 5 questions on risks, and examples to give inspiration in the interview situation. The examples were drawn from experiences among members of the safety committee. Most workers responded seriously, and anonymously.

The summed up results contained examples of risk taking, risks due to faulty machinery or organizational factors such as time pressure and lack of training. This was discussed within the leading group, who took action to implement some minor technical improvements. The need of widening the content of work was also an issue, which was, however, assessed as a long-term strategy. In cooperation with the shop steward it was furthermore decided, to upgrade knowledge on accident prevention and safety among the safety representatives. They were all assigned to union courses.

In the next step the results were given to safety committee, which in this company included all the safety groups. The discussion was led by the safety officer and a first line manager, and was not very engaged. Some proposals on preventive measures did, however, arise. The first line manager also stressed the safety representatives' obligation to correct colleagues taking risks. As he said, "--you should be policemen". Some safety representatives nodded, others seemed rather uneasy regarding this kind of task.

Group discussions among the blue-collar workers were postponed, explained by a booming order book and time pressure. Instead, the leading group decided to conduct these discussions later on at department meetings, with the presence of first line managers and the safety officer. This was contrary to idea of the ERFO tool, which recommends establishing a "room of learning" among workers separately. Discussions were scheduled to take place after the termination of the present project.

Outcome and participants' evaluation

The new preventive program led, in both companies, to bringing, hitherto, unidentified risks on the agenda. Already known risks, but until then not acted on, were also discussed. Historically, reasons of lack of action on the well-known risks could, in Enterprise A, be ascribed to difficulties reaching consensus on appropriate measures among "members" of the different safety cultures. In Enterprise B it could foremost be ascribed to a domination of the safety culture focused on workers' risk taking, and to the former management's authoritarian style of leadership. This meant, that workers' experiences of risks had hitherto been subdued. Sanctions, as an ultimate preventive mean in this company, had proved to be inefficient in the longer run.

As a result of the new program of accident prevention, preventive measures were taken on all identified risks in Enterprise A, whereas this was to a lesser extent the case in Enterprise B. In the former case the participants found, that the preventive program and tool had been promising. They also stressed, that the rather quick implementation of the suggested preventive measures, underpinned their positive experiences. It was decided to repeat the activities regularly, and to introduce it to other departments. Members of the leading group offered to coach participants elsewhere.

In Enterpise B the leading group and some of the safety groups were quite satisfied with the process and the outcome. They wished to repeat the activities, and recommended the ERFO tool to other enterprises of the corporation. Others, primarily those aligning to the safety culture embedding broad perspectives on risks and cooperation between management and workers on safety matters, were more skeptical. More dialogue with the blue-collar workers was called for. Several members of the safety organization also criticized the slow process of implementing preventive measures. The overall opinion was, however, that the activities held promises of dealing more seriously with health and safety matters, not least because of the decision to assign the safety representatives to courses on safety.

Accident rates, during a 1½-year period, were in both enterprises reduced to about 25% of the average rates of the prior 5-year period. This can, of course, be ascribed to the focus put on safety issues in this period, and not necessarily to the effect of the preventive program. However, in Enterprise A this situation is upheld one year after this project ended. We have no knowledge concerning Enterprise B.

Discussion and conclusion

Clearly, no single individual or managerial group is able to encompass all knowledge on risks, nor to foresee all possible events, which may lead to an accident. Acknowledging this, Reason (1990), among others, recommends developing a reporting system on errors, freed of barriers to openness, such as blame and sanctioning. We have found it promising to take the existing safety cultures – and the rationales behind – seriously. And from there, take a learning approach to prevention and culture change.

Involving workers in discussing risks has shown to be fruitful, when setting out to implement credible preventive measures. It is a two-sided challenge to establish the necessary "room of learning" on risks. On the one hand, the perspective has been to support generating new knowledge and to reach consensus on various conceptions of risks, leading to concrete preventive measures. On the other hand the perspective has been to support organizational learning on risks and accident prevention among actors, embedding different safety cultures. This has called for a social process of dialogue and negotiation, leading to culture change. This indeed occurred in Enterprise A. Members of the culture, dominated by production issues, experienced via participation, that preventive measures could be effective, and not necessarily work hindrances. Members of the safety culture dominated by a preventive and participative approach learned, on the other hand, how such a process could be conducted. There was less success in Enterprise B, as the cultures did not "move" very much during the process. This, we primarily ascribe to more management dominance and less workers' participation as well as to a lesser degree of "power free" dialogue and learning. Hence, preconditions of culture change were more limited in this company.

A program of change is a political process (Knights & Murray 1994), which is not linear and rationalistic from initial goal to end results. Rather, the direction and focus is developed under way, as the involved actors interact and formulate their different interests and perspectives. Such a process is "open-ended". But is not a point to be further discussed here.

Viewing the companies' different preconditions, some barriers to and promises of improving accident prevention could be pointed out. This relates to safety culture as well as to organizational matters. On the one hand, safety cultures, which are very diverse in interpretations of safety issues and, for example, toned by guilt, blame or expert orientation, have shown to set barriers, which impeded accident prevention. This was the case in Enterprise B. One the other hand, safety cultures, which could be united by certain common aspects – although at first sight in conflict – hold promises for the development of safer workplaces. This was the case in Enterprise A. Here, the "common denominator" of the cultures was mastery, - either regarding production or conditions of work and safety. Participation in learning processes supported the perspective of mastery on both issues, and served as motivation within the organization.

As safety culture is formed and developed via social interaction and by acting on concrete conditions, the specific context of organization and social relations is also of interest. Comparisons showed marked differences between the companies. The more successful company was characterized by:

- Top management, taking safety seriously and supplying the necessary resources, combined with resourceful employees, having experience on participation
- A reasonable degree of equality and mutual respect in the relations between management and workers.
- Nonhierarchical work organization and broad jobs, stimulating workers' problem solving competences.

Drawing on experiences from the two cases, we cautiously conclude, that these conditions, combined with sensitivity to the impact of competing safety cultures, seem to facilitate getting a better hold on accident prevention in companies.

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