

CODE OF PRACTICE

Research Findings for Practical Application

Teamwork I

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Designing Teamwork according to Occupational Safety and Health Principles – Basics for all Industries and Occupations

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1 Introduction

Since some form of teamwork was first introduced into the Swedish motor car industry in the early 1970s and research was conducted within the action programme "Humanisation of Working Life" in Germany, the benefits and drawbacks of this form of work organisation have been increasingly debated. Since the beginning of the 1990s the German motor car industry has been continuously experimenting various forms of teamwork. In other industries, various types of teamwork are gaining growing popularity in enterprises. However, teamwork initiatives are often introduced without responsibilities being clearly defined as concerns occupational safety. As a result of this, accident occurrence in enterprises has risen and employees' well-being is declining noticeably. This undoubtedly calls for a practical delivery of ergonomics findings on occupational safety and health promotion – for the benefit of both workers and management.

Whenever they plan and implement work systems incorporating various forms of teamwork, decision-makers ought to have state-of-the-art knowledge of occupational safety in teamwork. The present Code of Practice aims at supporting them in their task.

While seeking to improve occupational safety, it is clear that German standards of technical safety in the workplace are high compared to those in other countries. Yet the impact of organisation and individuals on accident occurrence and employees' health is becoming more and more perceptible.

In the context of teamwork introduction, quality improvement is given centre stage. Within a Continuous Improvement Process, teamwork is indeed used as a means of enhancing quality culture in the enterprise. Furthermore, team-working models of various kinds can contribute to raising health and safety consciousness in staff.

The present publication aims at initiating a discussion within teams on current risks to occupational safety and on possible methods to promote health in the workplace. The second objective is to raise employees' capacities to deal with health matters by providing those concerned with relevant insights and arguments.

This Code of Practice is based on the Research Application Report Fa 40 written by *Stoll* in 1998. The literature listed in the references is a complement to the present publication.

2 Various forms and concepts of teamwork and their contribution to promoting health

Whenever the topic of teamwork is addressed in public or scientific debate, the terminology used often differs according to its respective field of application. Depending on the sector and/or the enterprise concerned, conflicting views, terminology and ways of applying teamwork can be observed. Indeed, the existing variety of concepts makes it difficult to agree on a general and conclusive definition. Yet teamwork is generally understood as a temporary or permanent co-operation between people who come together for a short time – e.g. in seminars – or for a longer period: assembly teams.

More specifically, the term “teamwork” applies if:

- **a limited number of people** are jointly and holistically involved in completing an assignment consisting of several elements **over a longer period of time,**
- they have at least **one common goal,**
- they **work together closely** at achieving this or these goals,
- they define and set **common rules, standards and values** for themselves, and
- if individual team members who work closely together are tied by a strong **team spirit.**

Non-applicability

One cannot talk of teamwork when members of staff are merely brought together from an organisational point of view or if they change or rotate jobs since they neither interact nor do they pursue a common goal.

Example

Team-working concepts exist in various forms such as teamwork, semiautonomous teamwork, as well as problem-solving units and project teams who do not belong to the work organisation permanently. More precise definitions can be found in *Stoll's* 1998 report.

New team-working concepts promoting safety and health at work can be devised from the classification checklists like the one elaborated by *Frieling and Freiboth*. Indeed, such lists feature major elements of teamwork by category and characteristics.

Category	Characteristics
1. Organisational context	E.g. team size, team leaders, duration of cooperation, spatial vicinity of team members, length of team membership.
2. Extended team activities	Determining activities like quality control, maintenance and repairs, ordering materials and equipment.
3. Participation/autonomy	E.g. extent of team control over time in minutes, budget responsibility, power to make decisions on timing and contents of team meetings.
4. Team meetings	E.g. selecting team leaders, co-ordinating common work, naming participants, frequency of meetings, duration and timing.
5. Team-specific development and skills acquisition	Type and duration of staff training, timing (during or outside working hours), contents.
6. Continuous Improvement Process (CIP)	Does it exist? and if so, type of participants in CIP, records of suggestions for improvement, periodicity.

For the teamwork classification grid, see Frieling & Sonntag, 1999, pp 438

On the whole, adequately designed teamwork is beneficial to employees' health, especially when opportunities for participation and self-regulation within groups are greater than they used to be in earlier forms of work organisation. The extent of the team's authority to decide on tasks, working conditions and resources by itself will be determined whilst introducing teamwork.

The highest level of self-regulation can only have a positive impact if each individual team member is sufficiently qualified – or receives training to reach that stage – in order to be able to recognise the potential for self-regulation that objectively exists, build it up and above all, make use of it.

3 Identifying problem areas during team-work introduction and implementation

Whenever new forms of work organisation are introduced into enterprises, new types of hazards and stress are bound to arise in connection with organisational, technical and staff re-structuring measures. Teamwork that is not conducive to workers' health can also generate potentials for mental and psychosocial hazards in addition to those arising when new responsibilities of a practical-technical nature are entrusted to workers (e.g. having to cope with new working equipment such as high-speed machinery). Growing task integration, work intensification, bigger responsibilities, greater potential for social conflict are responsible for the rising incidence of mental stress. Comparing with traditional forms of production, it can be noticed that the workers' subjective level of stress tends to rise in the early stages of teamwork introduction.

What mental stresses and strains mean is precisely defined in DIN ISO 10075-1: Mental stresses are external factors affecting man. If they aren't balanced and place too much strain on the person concerned, they are likely to generate mental fatigue, a variety of stress-related states, monotony and mental satiation. In the process of teamworking, it means that a wide range of factors like the content of work, skills, work processes, breaks, surrounding conditions, communication and co-operation, work atmosphere or style of management may cause excessive mental strain.

If teamwork is not designed in a way that is conducive to workers' health, longterm physical and mental effects may translate into e.g. headaches, cardiovascular disorders, backache as the result of increased inner tension and mental diseases (e.g. depressions). This is especially true when teamwork is merely labelled as such to "cover up" measures taken to intensify work or output. Optimally designed teamwork ought to and can contribute to reducing stresses and strains.

The following passages will mainly feature and explain the various mental and psychosocial factors of stress that may arise in connection with teamwork.

3.1 Hazards related to mental and psychosocial stress

The main intention of teamwork is to expand the team's leeway of action that each individual team member is expected to design and structure for and by himself. For instance, it is the group who decides how tasks will be allocated internally, who is going to be designated as team leader and above all, what kind of jobs are to be carried out. In further-reaching forms

of teamwork, the group additionally has the opportunity of having a say in the selection of team members or when the team's objectives are being set in terms of quality and quantity to be achieved. The main advantage of this form of work organisation lies in its being conducive to higher work motivation. Indeed, it gives employees the opportunity to "co-determine" their own field(s) of activity, their jobs and the conditions under which those are to be performed. Enterprises see in this particular form of teamwork a chance of enhancing workers' flexibility and job satisfaction, and ultimately, quality and productivity. Indeed, they are aware of the fact that teamwork provides workers with a certain degree of freedom in the determination of tasks. Besides, it breaks the monotony that may have developed in their initial jobs. In terms of occupational health, an activity that involves high and varied physical mobility has a positive effect on physical well-being, which in turn contributes to reducing one-sided strain in the long term.

As a rule, teamwork proves rather disadvantageous to workers during its introductory phase. Indeed, the demands placed upon those concerned tend to grow:

They are expected to change jobs and/or workplaces, identify with their jobs on the whole, work independently, take on responsibilities, collaborate with other colleagues whilst being communicative and co-operative. According to individual personalities, there is a risk of overload, stress and intensifying workload for those team members who work together.

For those concerned, overload can result from their taking up new or hitherto unfamiliar jobs if they do not possess – or only partly have – the individual skills required to complete the tasks assigned. This also applies if their know-how cannot compensate for such a deficiency. Taking on extra responsibilities (e.g. for quality or timekeeping) can also prove taxing. Individual team members do not work in isolation but strongly depend on mutual co-operation for their work. Answerable for a faultless and top quality product aren't individual persons but the entire team. Team members are therefore jointly responsible for the timely execution of the tasks. This implies that they must also be able to manage conflicts arising within the team to be in a position to take action as required.

Time urgency and the pressure to do well are other types of overload that may arise if human resources have been cut back or functions re-allocated in unreasonable proportions to prepare for teamwork introduction. This is especially true when the same workload – if the order situation is unchanged – has to be completed by a reduced number of staff or when the same amount of workers have to cope with the extra work involved by an influx of orders over a longer period of time. In the teams' experience reports, there is growing evidence that the combination of staff cuts and productivity-orientated goal setting leads to highly intensified work. The pressure of time is particularly high while teams are trying to come to an agreement amongst themselves, a process which often lacks structure and clarity. Such situations create new problems which teams cannot solve – or only with difficulty – for lack of practice. According to employees, other causes of time pressure are interruptions in material flow, cycle times that are too short and in general, a very heavy workload.

3.1.1 Overload

3.1.2 Pressure of time, pressure to do well

3.2 Problems whilst forming teams

Forming teams that are destined to co-operate on a longer basis presupposes that individual team members possess the social skills that are required for shaping social communication within the group. The problem often is that in most groups, a proper team culture where e.g. making mistakes is acceptable and correcting them is occasionally done with the help of colleagues hasn't had enough time to develop. In situations of competition and/or group pressure, it is very difficult – if not impossible – to develop a sense of solidarity within the team. Yet solidarity is imperative if a higher potential of autonomy is to be assumed. Co-operation structures can be affected by a variety of processes related to group dynamics such as: informal, unauthorised hierarchies building up within the group, oppressive role distribution, exclusion of employees whose work capacity is impaired, to name a few examples. While forming the team and selecting each individual member, it is important to consider existing sympathy and antipathy as both factors contribute largely to the stability and effectiveness of team-work.

3.3 Problems related to limited communication

The greater the latitude to act and the greater the leeway of activity while performing a given job, the higher the necessity of making arrangements within the team. Typically, when communication flows well within the group, every team member puts in his knowledge to complete the task assigned and collaborates actively. The degree of identification with the results rises and so does work motivation. Yet, while the need for discussing and making arrangements within the team becomes stronger, employees are exposed to potential stress if misunderstandings and differences of opinion end up in conflicts and have to be managed subsequently.

Communication between the team and fields of activity situated before or after that of the team, as well as with cross functions such as occupational safety experts (safety engineers, company doctors) is reportedly very limited. Where it exists, it seldom deserves to be described as a communication process between equals. The information needed to ensure the smooth functioning of the team in a context of greater autonomy must be able to flow freely in both directions.

3.4 Problems related to assuming new responsibilities

Performing activities in teamwork typically implies the merging of hitherto separate areas of responsibility. Besides, working in teams and taking on holistic assignments gives employees greater latitude of action. Practically speaking, this means that specific areas of responsibility previously allocated to individual persons are to be covered by all members of the team in common or in turns. Individual team workers are exposed to higher health risks when, on the one hand, they have to perform new or hitherto unfamiliar activities but do not have – or only partly possess – the know-how or experience required to handle such situations and compensate for the novelty.

Practical-technical responsibilities (e.g. for quality control), organisational activities (e.g. production precision control) and social tasks (e.g. conflict management) are to be managed within the team through common decisionmaking.

At a DaimlerChrysler plant, individual or collective piecework used to be the rule before teamwork was introduced. Job contents were strictly limited to the tasks that were indispensable for producing the number of pieces required. After teamwork was introduced, the scope of workers' responsibilities expanded to include the following activities and aspects of work:

- Carrying out minor repairs and maintenance on machinery and facilities,
- Tooling, setting up,
- Job rotation,
- Parts of quality inspection,
- Pre-adjusting tools,
- Material procurement (ordering tools, support materials and un-machined parts),
- Planning staff training and development in agreement with the foreman,
- Planning holidays and overtime compensation days.

(from: Benkel 1999)

Example

Especially maintenance and repair jobs – as shown in the example – involve a particularly high exposure to risk (e.g. repairs being directly carried out on hazard points while production is still running), considering that individual team members often have less experience and specialist knowledge than the actual maintenance craftsmen. Furthermore, there is a risk of repair jobs being undertaken by team members who are not authorised to do so. Having an “interface” position, team leaders run the risk of being gradually at odds with their dual role. On the one hand, they are supposed to act as the teams' elected representatives, thus defending the teams' interests, on the other, they are there to feed the information and instructions given by the superiors (e.g. foremen) back to the teams. As a result of this, team leaders may have to face colliding interests and excessive demands placed upon them.

According to the World Health Organisation (WHO) definition, health promotion is about enabling all people to increase control over their health so that they have the power to make healthy choices and keep healthy. Hence health is understood as a state of complete physical, mental, and social well-being. To aim at such a broad definition of health in the field of labour protection is a very difficult task. Indeed, to date, labour protection has been essentially understood as the prevention of health hazards at the workplace. The awareness that health is to be considered as a potential worth fostering is slowly gathering momentum. Yet people can only develop their health potential to a larger extent if they can exert an influence on the factors that impact on their health.

Amongst other methods, health is achieved by caring both for oneself and for others. It results from the power of making one's own decisions while having control over one's own living conditions. For each individual, health implies being responsible for self and accountable to others. This task cannot be delegated to experts. Therefore, health promotion in enterprises must be aimed at all members of staff, encouraging them to clarify and strengthen personal responsibility and autonomy.

4 Practical recommendations for designing occupational safety and health

The starting point of every health promotion measure in enterprises is the workers' state of health (physical and mental health disorders or declining well-being) rather than a temporary state of illness, off-sick records or patterns of sick leave.

● Example

... concerning health promotion in enterprises

Health potentials can be exploited through worker-orientated interventions like:

- Training managers on the significance of health-promotion measures,
- Regular health monitoring and individual health counselling,
- Courses in health promotion,
- Social skills development,
- Communication training and coping programmes,
- Courses in time management techniques and
- body activation (physical exercise, sports),

and through organisational interventions such as:

- Setting up a working party "Health and Health Circles",
- Supporting corporate self-help groups,
- Making corporate decisions more transparent,
- Encouraging participative work structuring and job design,
- Extending workers' latitude to take action and make decisions,
- Suppressing formal hierarchy (flat hierarchy) and
- introducing staff-orientated working time arrangements.

4.1 Criteria for humane work design

Issuing recommendations on how to design and structure teamwork in order to reduce the above-mentioned stresses and strains first implies incorporating the criteria defining what humane work structuring actually is. These can be understood as basic guidelines.

One must bear in mind that all criteria are to be put into practice as they interact in every work situation. Besides, working conditions suitable for man are not likely to arise if only isolated criteria are fulfilled.

The set of criteria **harmlessness/tolerability** refers to averting damages to employees' health in general, whilst individual consideration has to be given to different categories of workforce such as young and older workers; those with impaired capacity; men vs. women. Team-working should not result in any excessive physical demands (e.g., resulting from inadequacies between working equipment and team workers using it) or mental strains (e.g., being overtaxed by time pressure and the pressure to do well) over a longer period of time.

The **practicability** criterion refers e.g. to tools and machines being designed and arranged in such a way as to be easily manipulated by the operator and ergonomically suitable for the human body. According to this, working equipment whose design and/or arrangement is suitable for human use should be made in such a way as to allow prolonged work and not just temporary use. For instance, if in a team-working context, machines are to be operated by different people, working equipment has to be designed

and arranged in such a way as to prevent incorrect body posture which can result in long-term health problems for team members.

The **reasonability/freedom from impairment** criteria focus on the evaluation of the contents of the tasks to be completed. The work content carried out in a team should not result in wrong strains – overload or underload or a combination of both – affecting team members. Impairment can lead to e.g. psychosomatic disorders if those affected cannot contribute to suppressing the causes.

The **satisfaction/personal development** criteria question whether job contents are conducive to workers' personal development and self-fulfilment or not. Considered as such in teamwork are the following job characteristics: completion of holistic and varying tasks, level of job integration, i.e. planning, making decisions, executing and checking the whole activity concerned, opportunities for co-operation, communication and further learning. According to these criteria, workers should be able to clearly recognise the purpose of the process and/or the product they are involved in and above all, the opportunity they have to impact on it.

The **social compatibility/participation** aspect refers to the opportunities given both to individual workers and the entire workforce of a system (i.e., the team) to evaluate, participate and co-operate. This has a major impact on the structuring of work and the design of jobs. In addition, it shapes the nature of social interaction at the workplace. Successful and co-operative collaboration fosters trust and understanding between workers and helps to avoid – in their opinion – detrimental design errors in the production process.

Introducing teamwork requires the participation of all those concerned, from the works management, via the occupational safety experts, right down to the future team members including their immediate superiors. In practice, workers are often little prepared for working in teams and too much emphasis is placed on the organisational context (compare with *Fieger, Bartel, 1997*). Where change processes have been initiated according to the hitherto traditional top-down procedure, organisations have to re-learn and adapt.

4.2 Participation of all those concerned

Besides, involving staff in the early planning phase of teamwork can be advocated for the following reasons:

- Due to their experience, the employees concerned have an exceptionally wide-ranging knowledge of their respective work situations
- The employees to be won over to teamwork and who eventually contribute most to its success develop higher work motivation, enhanced creativity and commitment
- They put in their ability to analyse and cope with mental stress
- Participative forms of work organisation are also essential for higher effectiveness in the use of new technologies, and
- The degree of identification with and acceptance of the necessary changes becomes higher

Besides, workers' participation is one of the main pillars of the European occupational health and safety legislation. Framework Directive 89/391/EEC provides for active workers' participation, consultation and information. Workers are regarded as subjects acting independently and competently who put their practical knowledge at the disposal and for the benefit of all workers in order to promote safety and health at work. To this effect, workers are entitled to co-determine and participate in the administration of business undertakings as specified in Part Four – third and fourth subdivision of the "Betriebsverfassungsgesetz" (BetrVG), the Employees' Representation Act applicable to the private sector in Germany. Employees of the public sector in Germany enjoy similar rights as provided for in the "Bundespersonalvertretungsgesetz (BPersVG)", the Federal Representation Act for all those employed by the Civil Service. Moreover, individual German states have their own staff representation laws defining such rights. As a matter of example, the codetermination and participation rights of works and staff councils are described in detail in § 87 of BetrVG as well as in §§ 75 and 76 of BPersVG.

4.3 Designing and structuring teamwork within a work system according to safety and health principles

If teamwork is to be introduced into an organisation and designed to comply with health protection principles, the entire work system will be expected to meet certain requirements in terms of its design and structure, notwithstanding interacting dimensions such as technology, work organisation and workforce (the working individual).

The present Code of Practice focuses on presenting and analysing the work organisation and the personnel aspects as both are major keys to resolving the type of teamwork-related problems mentioned in Chapter 3. Furthermore, these recommendations concentrate on aspects pertaining to workers' protection and risk prevention, thus complementing the general rules to be respected whilst introducing teamwork.

4.3.1 Work organisation

When optimally practised, teamwork in its various forms offers the prospect of integrating occupational safety and health into the organisation development process of the enterprise concerned. This comes in addition to the usual economic benefits such as increased flexibility, efficiency and productivity.

Change processes that have to be initiated in the organisation of work concomitantly with teamwork introduction are a welcome opportunity to entirely redefine the place of employee protection and risk prevention activities within the organisation. It is the occasion to take legal provisions into consideration (e.g., submitting proposals according to § 17, section 1 of ArbSchG. Before considering the full integration of safety activities into enterprises and the way they are structured in the organisation, it is essential to develop and introduce an integrated safety and health management system and/or appropriate leadership and organisational concepts.

Introducing an integrated safety and health management system

Objectives of health and safety prevention defined by management are

- either derived from corporate objectives or,
- incorporated in those.

Generate awareness of problems and readiness to accept and adapt to changes

- by pointing out the benefits,
- creating incentives.

Change “philosophy” or strategies

- by combining industrial safety and health protection,
- safety at work should not exclusively concern the experts, but all members of staff and especially supervisors,
- by integrating employee protection into the annual target plans and/or into the objectives agreed upon within the company as well in the annual progress review,
- by incorporating the issue into a comprehensive quality management (system).

Provide for allround prevention

- by introducing measures related to safety engineering and ergonomic changes, plus,
- organisational measures, plus,
- measures referring to behavioural science.

Put the emphasis on integrative design and structuring

- by considering problems holistically,
- by encouraging co-operation between different skill disciplines.

Redefine the role and responsibilities of safety engineers

- fewer people executing instructions,
- more coordinators, coaches, facilitators

Involve those concerned more thoroughly and, above all, more actively

- in particular through teamwork (safety promotion carried out by small groups).

Provide information and training according to the target groups concerned

- safety engineers, decision-makers and subordinates

How to introduce an integrated safety and health protection management system by Braun, et al. 1999 , see also Ritter 1995 and Ritter, Reim, Schulte 2000.

Safety and health management systems seek to design and structure employee protection by introducing organised processes and/or operation sequences. This is not only done in response to accidents or job-related health hazards but with the aim of avoiding their occurrence at source by proceeding systematically. It protects workers' health and enhances their motivation to act in a health- and safety-conscious way. To this end, it is essential to find a way of securely anchoring employee protection in organisational processes as well as in company management structures.

This management system is based on the necessity of continuously improving internal employee protection by actively involving the entire com-

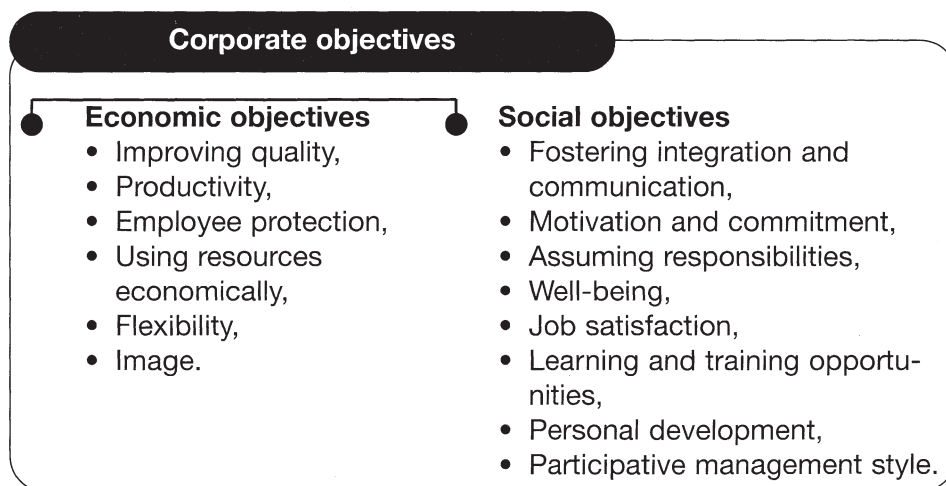
pany staff. This is ultimately a means of raising acceptance of the safety rules implied.

Setting up an safety and health management system implies describing its organisational structure. It means for instance, determining the duties of the company management, the responsibilities of supervisors as well as the jobs to be carried out by the specialists in charge, or by working parties engaged in occupational safety. Arrangements concerning the sequence of operations, questions about the type of organisation needed, the way information is to flow and co-operation to be arranged complement the set-up of such a system.

More detailed information on the introduction of similar systems as well as positive examples can be found in numerous guides (e.g., *Braun et al.*, 1999; in *Loch*, 1999; *Ritter et al.*, 2000; *Ritter*, 2000). Individual aspects of such a safety and health management system are described below in detail.

Defining clear corporate objectives

The fact that employee protection is already securely anchored in corporate objectives may be a first indication of the importance given to safety and health in the enterprise concerned. Besides, it is a prerequisite to its successful implementation. It further requires that all employees be informed of its underlying principles so that they have the chance of reflecting upon their contents. In this way, these safety principles are more likely to become integral parts of a proper – truly experienced – corporate culture (e.g., where superiors are taken as role models). To this end, equal consideration must be given to the economic and social objectives of the enterprise so that their impact can be simultaneous and parallel (principle of dual goal setting).



Examples of how to formulate corporate objectives derived from Stoll 1998

Allocating tasks and responsibilities

Whenever teamwork is introduced into organisations, teams or groups are granted more latitude and authority to act (integration of tasks) and roles are typically re-allocated. Such a development calls for a precise re-definition of tasks and responsibilities as well as for their re-allocation to team

members including team leader, specialist personnel and supervisory staff. A great number of conflicts are sparked off by the fact that managers, employees or specialist departments do not exactly know what key functions they are supposed to assume under such new circumstances.

The list of tasks and roles featured below clarifies how the different areas of responsibilities have changed and expanded and how they interact with each other.

Tasks and roles according to interest groups

Teams

- Enjoy semi-autonomy in completing the jobs assigned;
- Co-operation within the group is designed and structured by the team members themselves;
- Self-regulation of task allocation and co-operation lies within the group;
- Define the targets to be achieved together with superiors;
- Optimise work flow and individual operations;
- Work in a quality-conscious, cost-effective and timely way;
- Exercise their right to submit proposals on training and development/take part in planning training activities.

Team leaders

- Team leaders are integrated into the normal work process;
- Clarify internal job allocation with the group;
- Liaise with departments situated before or after that of the team in the work flow chart;
- Assist team members in achieving a consensus and in managing conflicts internally;
- Prepare, run and chair team meetings, keep a record of minutes;
- Act as team representatives before supervisory staff.

Supervisory staff/foremen

- Assume personnel responsibilities/are officially authorised superiors;
- Set targets together with teams and monitor their progress;
- Support and provide counselling (if need be, take decisions) in situations that teams cannot resolve on their own;
- Plan training and development activities together with the team and if possible arrange for training and development to take place in house;
- Take part in work structuring and job designing;
- Support the Continuous Improvement Process (CIP);
- Provide information and co-ordination across departmental divisions.

Workers' representatives

- Settle and secure the single plant bargaining agreements
- Take part in project management and completion whenever new forms of work are designed
- Stabilise change and development processes
- Defend the humane side of team-focused work structuring
- Accompany processes socially
- Hold a political mandate towards the company management.

Tasks and roles of various interest groups within company staff as defined by Herzer 1996

Clarifying organisation and responsibilities

Within the line management functions, changes arise in the allocation of responsibilities and in the sequence of operations according to the nature and degree of self-organisation in the team. Especially interface functions (e.g., foreman level) are expected to assume different roles and responsibilities. The foreman's role (middle management) – if this type of line function still exists – switches from that of giving orders and instructions to co-ordinating and providing advice. The foreman puts his knowledge – in employee protection matters, inter alia, – at the team's disposal, thus enlarging his role as adviser and facilitator. Having a close relationship with the team, he has a general picture of the current state and progress of safety and health protection in the respective teams. Has this hierarchical level disappeared as a result of a re-structuring in the areas of responsibilities, it is essential to clarify which level of hierarchy is going to take over "supervision, counselling and information" in the enterprise concerned, in addition to its usual duties. During the changeover, it is the foremen's duty to make arrangements in order to secure a proper information flow between the two shifts.

In any case, it is essential to clearly define responsibilities across all line functions, notwithstanding the fact that law stipulates it. (§§ 3ff and 13 of ArbSchG). However, it should not be omitted that authority cannot be entirely devolved. Employers in general and the team members' superiors in particular remain principally responsible for the execution of orders and measures. (§§ 2 and 13 of BGV A 1).

Securing co-operation, communication and documentation

In teamwork, the close co-operation that is needed between team members demands from all participants a higher capacity for communication. The team is then entrusted with the task of discussing, making, and fulfilling arrangements on its own authority according to the way jobs and responsibilities were allocated. Successful communication within the group is decisive, if potential sources of misunderstandings and frictions are to be averted and definite targets are to be reached. This presupposes that the way tasks are allocated among all participants is transparent to every single person involved, not only to employees working in teams but also to specialist staff and those holding supervisory posts. To this end, it is necessary to set up clear and distinct information channels.

Close co-operation also demands close collaboration between company doctors, safety engineers, other specialists in charge (e.g. of dangerous goods) and workers' representatives (§ 9 of ASiG, the German Occupational Safety Act). They are all expected to pool and complement each other's specialist knowledge in order to accomplish the tasks assigned to them according to § 10, line 1 of ASiG, as well as to co-ordinate their ways of proceeding. By organising meetings to promote an exchange of views across teams, the practical knowledge available on the subject of labour protection can be discussed and assessed together with specialist staff before being put at the disposal of all other teams. Additionally, it is possible to occasionally include specialist staff in teams (e.g. during team-internal meetings) if need be.

Information boards or wall news-sheets are proven means of making current information (e.g. trends in accident and illness occurrence, results of team meetings) known to all. Besides, manuals and other additional publications made available to employees stand for transparency in the purpose and structure of the organisation of labour protection in the enterprise concerned. New communication technologies provide solutions for enhanced flexibility in the way the information flow is supported in undertakings. Through an internal communication network like Intranet, each employee can be directly informed at his or her workplace.

In order for the parties concerned to verify whether it had been possible to comply with the major prerequisites for securing communication defined by the German Occupational Safety and Health Act, we identified a series of critical questions to be answered:

Challenges facing the parties concerned

Supervisory staff

How can we fulfil our legal obligations as defined by the German Occupational Safety and Health Act? How can we minimise the risk of liability? To whom can we delegate the task of carrying out the jobs assigned?

Safety engineers and company doctors

How can we fulfil our duties (e.g. providing advice and support) in the time available to us? How can we avoid being burdened with carrying out the jobs assigned? How can we suitably train and develop to meet the new demands (adequacy between personnel, technology and organisation etc.)?

Workers' representatives

How can we be thoroughly involved in decisionmaking processes (e.g., employee protection policy and objectives) and exercise our right of co-determination? How can we defend workers' interests and obtain their acceptance of decisions?

Workers

How can we take part in the debate and improve our conditions of work? To which extent are our concerns taken seriously?

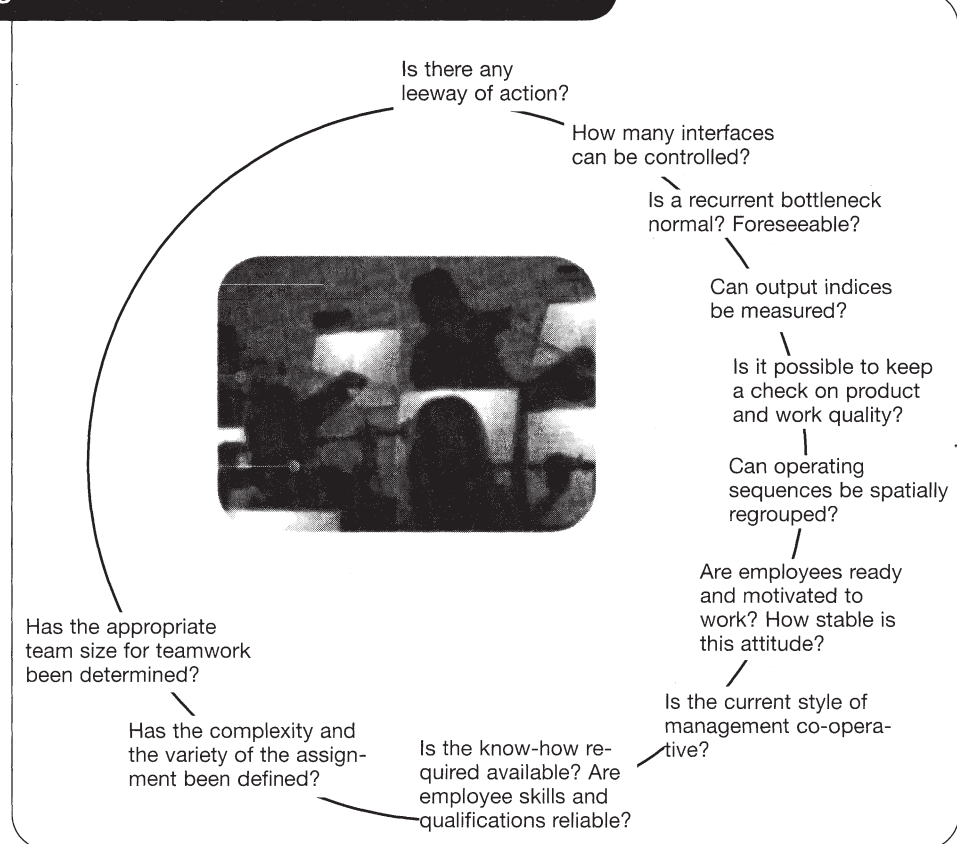
How to secure communication in teamwork in Braun, et al. 1999

Delimiting tasks and responsibilities of teams

For work carried out in teams to be varied and multi-faceted, it is advisable to delimit a sphere of responsibility that is wide enough to include a broader range of activity than hitherto. Besides, it is recommended while "designing" variety to make sure that the tasks to be performed necessitate a varied physical or mental activity (e.g. performing jobs that require changing posture, strain different groups of muscles or pose a variety of mental challenges). The rationale behind this is, on the one hand, to avoid one-sided stresses and strains over a longer period of time and, on the other, to pro-

vide incentives to learn. To this end, it is important to assign jobs that are holistic, in other words, to grant areas of responsibilities that include activities or functions that take place before or after the actual work to be performed, such as tools and material procurement, pre-checks, output records and quality inspection. Similarly, repair and maintenance tasks can be transferred to the team on certain conditions. Finally, employees must be capable of performing the work concerned in terms of their personal, social and professional suitability as well as on account of their practical experience. For that matter, they should also be given the opportunity to design, organise and arrange their work and the equipment needed for it according to their individual needs and wants.

Checking overall fitness for teamwork



Criteria of fitness for teamwork derived from Rosner (1997). picture: copyright 2000, Comstock, Inc.

With the help of the above diagram, it should be possible to gauge what aspects are worth considering while assessing the suitability of the activities and tasks to be completed in teams.

Forming and making up teams

When teamwork introduction begins, the group firstly goes through a dynamic phase of orientation and constitution. This is when latent fights for positions, divergent work styles, differences in attitudes to work are becoming visible and start impacting on teamwork. The way roles are distributed

within the team cannot be planned or laid down by outsiders right from the beginning. Differences in roles assumed are the result of a dynamic group-forming process, whereas some team members are satisfied with their roles and some aren't. Disappointment, friction and criticism are the consequence of divergent expectations of what contents the job(s) should have and how social interchange should function. In such a context, it is hardly possible to prevent the emergence of smaller splinter groups.

Whilst forming teams, it is advisable to rely on well-established structures and yet make sure that the performance potential is balanced. Such structures have fostered the emergence of informal groups that are likely to facilitate the makeup of official teams in the context of a forthcoming teamwork introduction. In enterprises, the size of teams tends to vary between 6 and 22 members at the most. Yet the ideal size would appear to lie between 4 and 7. When members are in excess of seven, it is more difficult for authority structures based on specialist knowledge and personality to emerge and establish themselves within the team. Besides, the identity-searching process taking place within the group is more arduous.

In a German bank called "Verein und Westbank", teams had been formed by a commission consisting of an equal number of project control groups, departmental and divisional managers and works council representatives several months before teamwork was due to begin. The personal experiences that individual commission members had had in the past with the employees concerned were consciously taken into account in that process. Similarly, attention was paid to personal relationships and individual preferences whilst forming those teams. (from: *Hilf, et al., 1996*)

Examples

Introducing team meetings and team leaders

Team meetings are internal tools for reflecting upon and eventually resolving current problems. They provide the opportunity of making arrangements and finding agreements on how work should be divided and organised or target achievement checked. Such meetings provide a valuable forum of communication and information as they enable all those involved to take part. On the subject of labour protection, field-related aspects such as risk and stress assessment, information on occupational safety matters, accident rate or sickness and disease records should be addressed during such meetings. According to the nature of topics on the agenda, it is possible to call upon experts from case to case. In enterprises, team meetings tend to last from 30 minutes onwards per week without any time limitation. Their average duration per week depends on the degree of experience and integration of all team-members, on time constraints imposed by market forces, on the skills and training required and other company-specific circumstances. Ideally, team members schedule team meetings by themselves. As information is conveyed in both directions, the exchange of views between teams and specialist staff helps to secure the necessary co-operation. As stipulated in § 12 of ArbSchG, team meetings can however never supersede the instruction and/or briefing given by a superior, even if he or she is present at such team meetings. Team leaders are not supposed to assume superiors' functions with i.e. disciplinary power and the authority to give in-

structions. They are expected to represent the teams. In order for the results of team meetings to be useful to future decisions, a record of the minutes should be kept and made available to the persons concerned.

4.3.2 Staff training and development

Apart from the organisational aspects discussed above, performing work in teams requires from supervisors and workers comprehensive as well as continuous learning and training. Executives or supervisors must be prepared to relinquish power and devolve parts of their responsibilities. Switching from a supervisory role to an advisory function means for this category of staff widening their specialist know-how, their methodical as well as their social skills. The purpose of continuous learning and training is to enable all those involved in the process to assess and cope with new or changed demands such as enlarged job contents, for example. It is therefore imperative to incorporate further learning and training considerations into re-organisation schemes as soon as these are being devised.

As far as safety specialists are concerned, the employer's obligation to provide for workers' further training and development is laid down in § 5, section 3 of ASiG and in § 5, section 3 of BGV A 6. Similar legal provisions concerning company doctors can be found in § 2, section 3 of ASiG and again in § 5 of BGV A 7. Besides, employees are to be regularly briefed on occupational safety and health matters. This must take place as soon as they are hired and then at least once a year after they have started or whenever their jobs undergo changes (§ 12 of ArbSchG).

● Example

New forms of information processing were scheduled for introduction in the administrative departments of a steelworks. The choice of a work organisation concept was not to be imposed upon the workers concerned. On the contrary, they were expected to develop a solution by themselves. Participation was envisaged holistically involving topics of discussion such as technology and organisation design as well as the determination of training needs and skills requirements. In order for employees to take part in developing potential solutions actively and efficiently, some of them had been previously sent on a four-day seminar to be trained as facilitators. Its focus was on learning facilitation and visualisation techniques (meta-plan) and acquiring methodical skills to be able to present arguments, facilitate and run ad hoc groups. (from *Hilf et al.*, 1996)

Delivering specialist skills

Whereas task integration is widely acclaimed for its lowering effect on one-sided stress, it is precisely one of the reasons why team members now have to deal with unprecedented job enlargement and enrichment.

● Example

Employees of an insurance company who had trained to accomplish specific tasks as specialists were now supposed to become "allround office workers". To this end, they had to familiarise themselves with hitherto unknown fields, which in turn allowed them to gain a broader knowledge of insurance technicalities. Moreover, they had to acquire basic knowledge in legal and fiscal matters as well as a thorough grounding in payment systems. (from *Hilf et al.*, 1996)

This may concern jobs that – from the perspective of labour – require a formal qualification (e.g. operating machines or technical equipment such as forklift trucks or cranes). It is therefore imperative to either make sure that the workers concerned within the group obtain the qualifications required (see § 12 of ArbSchG) or make the use of specific machinery or technology altogether redundant.

The strategy adopted in the case featured below was to concentrate certain jobs into the hands of specialists in the team.

In an established work system a semiautonomous team was implemented after a year's preparation. Team design was based on the following criteria:

- A team consists of 7 employees, one of whom is to act as a team leader.
- The entire team is to fully operate all the equipment available, which also implies:
 - steering the crane,
 - performing minor repairs,
 - setting the machinery up,
 - mechanising plant operations, and
 - planning orders and their sequence
- integrating quality assurance tasks
- taking care of their own holiday planning

In the present case, every team member was supposed to be capable of setting up and operating the equipment and facilities available. Additionally, individual workers who held the necessary qualifications were appointed as specialists to perform special repair or maintenance jobs. (derived from *Stoll*, 1998)

Example

The example above illustrates a specific approach to job design called “**flexible specialisation**” which no longer expects every single team member to perform all activities. For work areas that are safety-sensitive and/or where specialisation is indispensable at least, such an approach would appear to be practicable and sensible.

Moreover, all employees and facilitators should be further trained and educated in issues relating to responsibility for safety at work, risk assessment, ergonomics and corporate health protection policies. Indeed, it is part of the rationale behind teamwork to assume responsibility for one's own behaviour as much for that of the group. This obviously requires from those involved the ability to become aware, to assess and to learn how to mitigate their own stress in accordance with the principle of corporate health prevention and promotion. Teams should be given a demonstration on how to issues relating to occupational safety into team meetings, for example – and why this should be done at all.

Facilitators could be entrusted with fostering the integration of, and selecting safety-related topics for discussion at team meetings. For that matter, it would make sense to co-operate with those superiors who have been conferred the duty of briefing and instructing personnel as stipulated in § 7, section 2 of BGV A 1.

Job enlargement resulting from changes in areas of responsibility does not only occur with team members but also with occupational safety and health experts such as safety engineers and company doctors. For both categories of staff, this means acquiring new skills through further training and education. Job enlargement for safety experts basically means accompanying and assisting the teams in their work for the protection of health and safety.

● Example

... Job enlargement can consist of

- Helping the teams with the purchase of personal protective equipment (selecting manufacturers, compiling users' experiences with protective equipment),
- Advising teams on how to handle dangerous support materials, supplying important data,
- Assisting the respective teams as the contact person for all questions concerning teamwork design and its compliance with safety and health principles,
- Providing counselling on how to apply proven ergonomic findings on human-focused work structuring or job design,
- Providing advice in the framework of the teams' self-regulation mission.

Delivering social skills

To achieve the human and efficiency objectives pursued in teamwork, team members have to bring along the personal prerequisites needed in decisionmaking processes. While basic knowledge and skills in the trade concerned have generally been acquired both during formal vocational training and on the job, the same does not necessarily apply to organisational, social and/or interpersonal skills. Yet in team-working, these are precisely the skills that are fundamental to productive capacity and personal growth, which are both considered today as key aspects in the process of work. The tools used for developing social skills while teamwork is being introduced or its progress monitored – e.g. communication and conflict management seminars – should not only be aimed at team leaders and/or facilitators but involve every single team member.

The task of delivering skills and providing guidance to teams is not exclusively confined to the introductory phase. Those concerned have to be accompanied and supported over a longer period of time. The mission of self-regulation entrusted to the teams may in fact lead to conflicts that place excessive strain on team members, and may pose a major threat to the kind of social cohesion that was originally intended. Indeed, for poorer performers, friction between team members due e.g. to self-determined standards of performance, potentially entails the risk of being excluded.

Delivering methodical skills

While extra responsibilities are taken on in a teamwork context, skills such as the ability to assess, to plan, to decide and to organise tend to become more and more significant. As with social skills, delivering methodical skills isn't sector-specific, it occurs separately from the tasks to be completed in

teams. Employees are granted more latitude to act in accordance with the principles of increased staff participation. They are often expected to become actively involved in the re-organisation process (e.g., join board meetings and work in commissions, take part in determining skills requirements). The gain in awareness it requires from those concerned has to be additionally supported by the delivery of methodical skills such as the ability to run, chair and mediate at meetings as well as creativity and problem-solving techniques.

Active employee protection relies upon involving and committing all workers. The aim of various concepts focusing on team-orientated safety work is to exploit individual team-workers' know-how in an effective way by activating their learning and problem-solving potential as well as their creativity. Indeed, these are the resources they will ultimately use to identify safety-related problem areas and work out possible solutions.

4.4 Concepts for integrating employee protection issues into teamwork

Yet the methods listed below are still not particularly widespread in enterprises or organisations. To implement these effectively, the organisation concerned has to change its conception of occupational safety in the following points:

- Discard the belief according to which "occupational safety is to be left to safety experts" and make it "the responsibility of supervisory staff",
- Involve all the people concerned (i.e., employees to take an active part in safety measures and risk prevention),
- Focus on preventive measures regarding organisation and behaviour at the workplace.

A variety of concepts with different priorities has emerged, among which the so-called "circles". A distinction is usually drawn between the different types of circles according to their particular level of organisation, the composition of the team and the subject(s) to be discussed.

The adjacent table outlines the various types of circles that can be found.

In co-operation with a health insurance company and an external institution specialised in promoting health in enterprises, the Berlin-based Reemtsma plant had an instrument developed that was to focus on the work situation of staff and optimise it continuously. This experiment was carried out in 1997. Apart from lowering absenteeism, the idea was to analyse and eliminate causes of accidents. The four circles that were set up in the shop were company-specific types of safety and health circles. They consisted of representatives from the production, service and administrative departments whereas each member (47 in total) was assigned the additional role of a safety officer.

In consultation with the safety engineers, the employees were able to address the following issues pertaining to the firm's environment:

Example

- Investigation of hazards and factors of disturbance,
 - analysis of absenteeism (and possible explanations),
 - causes of accidents and their possible elimination,
 - analysis of the technical and organisational operations that may impact on workers' health.
- (from: *Baudis* 1999)

Concepts of circle work

Type of circle	Objectives	Level of organisation	Team composition	Selection of subjects of discussion
Quality circle	Improve quality, save costs, enhance motivation, increase job satisfaction	According to the traditional conception of hierarchy in quality circles, there are: <ul style="list-style-type: none"> • control teams • coordinators • facilitators • teams 	Members of staff from the operational side, foremen acting as facilitators	Free selection of subjects by employees
"Learnshop"	Deliver tuition, improve conditions of work	<ul style="list-style-type: none"> • learnshop head office • head of learnshop • facilitators' round • facilitators • learnshop round 	Members of staff from the operational side, trained facilitators	Subjects selected by team or works management
Safety circle	Eliminate/reduce hazards and stresses, raise employee safety-consciousness	<ul style="list-style-type: none"> • control team • co-ordinator • safety circle 	Employees from various departments and levels of hierarchy	Subjects selected by team, e.g. according to focus of accidents or hazard points
Health circle according to the "Dusseldorf Model"	Diminish occupational stress by: <ul style="list-style-type: none"> • identifying stressful situations • developing suggestions for improvement 	<ul style="list-style-type: none"> • project steering team • coordinator • team 	Employees from a single department, experts from various levels of hierarchy, 8 to 12 participants, external facilitator	Subject to be focused on: occupational health hazards in general
Health circle according to the "Berlin Model"	Reduce stress-related diseases by: <ul style="list-style-type: none"> • learning new ways and patterns of coping • creating a better work atmosphere 	Comparatively low level of organisation: <ul style="list-style-type: none"> • expert body • contact committee • team 	Employees having the same position in hierarchy, e.g. foreman, external facilitator, 12-15 members	Subject to be focused on: stress

Comparative overview of various concepts of participative circle work. Compare with Federal Institute for Occupational Safety and Health, 1996.

In this respect, *Zink* and *Ritter* (1993) provided concrete guidelines for safety engineers on how to initiate and install safety teams.

5 Teamwork and older workers

All employees aged over 50 shall fall into the “older worker category” since persons in this age group generally have more difficulty in finding new employment whenever they have lost their jobs.

Thanks to their experience and skills potential, older employees bring a valuable input into teams encompassing different age groups. From a knowledge management point of view, older workers constitute an indispensable resource for the knowledge-based economy of an enterprise or an organisation (compare with *Kayser, Uepping, 1997*). Besides, older workers’ social skills are of prime importance for successful teamwork. Consequently, they often act as “integrators”.

Whether teamwork actually fosters better health in older workers or generates stress that may prove impairing to them is a question that can only be answered in the context of their specific job and that of the prevailing work culture in a particular industry or enterprise.

In companies seeking to “rejuvenate” their staff, older employees tend to face greater difficulties as they do not fit the prevailing model of “the young go-getters”. As a result of this, integration may prove problematic since their particular talents are not being recognised as such by other team members.

The prejudice according to which older workers tend to fall ill more often than younger ones is invalidated by the following findings: Older workforce is characterised by a lower illness frequency rate with longer convalescence, less absenteeism, fewer accidents, lower turnover, higher job satisfaction and a more positive attitude to work. These results are averaged out over the total working population. Yet, if one considers single industries and/or occupations, one can partly find a higher rate of illness frequency in older workers. However, this is compensated on the whole by lower rates in other categories of industries or occupations.

How much team members accept older workers or not widely depends on the predominant model that has established itself in a given enterprise as a result of a particular tradition in the trade or a conscious staff policy. This model is characterised by various features such as physical abilities (muscle strength, stamina), cognitive and mental capacity (specialist knowledge, professional experience, discernment), mental abilities and personal characteristics (motivation, dependability, being level-headed), as well as by behavioural styles and attitudes (e.g. being committed and co-operative).

5.1 Limited acceptance

If an activity calls for particular skills that can be predominantly found in older employees, e.g. for a gang foreman to remain level-headed whenever he is faced with a whole string of conflicting interests on larger construction sites or when members of an assembly team are sent abroad to set up a piece of machinery (e.g. a printing machine), the acceptance towards the older workforce tends to rise. In such situations, social recognition and involvement in decisionmaking may be – at least temporarily – conducive to better health.

Conversely, if a particular job places high demands on workers in terms of time or pace-keeping and physical capacity, e.g. during assembly-line work in car factories, older workers are more likely to face integration problems than younger ones as the former generally cannot keep up the fast work pace. Psychosomatic impairments are the usual effects of prolonged stress. In this sense, mutual acceptance plus the necessity to integrate all team members is an essential feature of teamwork as it fosters workers' health.

5.2 Problems of exclusion whilst forming teams

The way a working party or a team comes into being is the key to long-lasting acceptance. In nearly all team models that exist in practice and in theory, finding and developing one's own team identity under appropriate guidance has proved to be the best method. If this process is left totally unaccompanied, there is a risk of having small groups that are strong (e.g., with young, self-confident participants) and tend to dominate the team's structure and work. Older members are usually an obstacle to power imbalances as they are more familiar with such social processes, considering their (longer) experience of life.

In such critical situations, older employees run the risk of bearing the brunt of conflicts that may arise between them and dominant team members during teamwork introduction. For a team that relies on extended specialist skills and a sense of responsibility in its members, this may prove highly detrimental to effectiveness in the work performance process.

The use of facilitation techniques may help to highlight such risks and make potential team members aware of their existence. This is a way of preventing power imbalance and dominance from developing at an early stage. With the help of facilitation, it is possible to identify which ones of the team members' personal abilities are required and desirable for a particular job. Besides, team forming becomes more objective and rational.

Example

At the Felten & Guillaume plant, production teams encompassing all age groups were installed in the production area and organised in so-called "production islands". The idea was to diminish one-sided stress by varying the demands placed upon production staff while broadening the content of their work. Older team members were mainly apprehensive of learning how to handle the new CNC-technologies. However it was possible to suppress such fears by using special learning techniques that were adapted to this age group. There were differences in the way older and younger workers learned and made progress. Indeed, older employees "struggled hard" with theoretical knowledge – e.g. geometry basics or the abstract wording of DIN 66025 for controlled systems. Conversely, older employees were able to assimilate contents particularly swiftly whenever those matched their practical experience, e.g. programming a CNC-machine in the manual input mode.

T stands for the technical aspect of the model

Supply technology applications that are easy to learn and to manage. They should relate to the existing know-how of older workers.

O stands for the organisational aspect

Design and structure work to encompass wide-ranging work contents, i.e., enlarge and enrich work tasks that were formerly influenced by Taylorism in the narrow sense of the word. Turn them into assignments that give older employees the opportunity to plan, control, execute and check a given job by themselves in consultation with the team.

P stands for personnel in terms of training and development

Initiation and training schemes preparing for new work structures must fit the learning habits of older staff. This implies giving full consideration to the know-how available in those concerned.

5.3 Recommendations for team-work design according to the TOP model

Appendix

ArbSchG	• Arbeitsschutzgesetz	• Occupational Safety and Health Act
ASiG	• Arbeitssicherheitsgesetz	• Occupational Safety Act
BetrVG	• Betriebsverfassungsgesetz	• Employees' Representation Act (private sector)
BGV	• Berufsgenossenschaftliche Vorschrift	• Regulations of the Berufsgenossenschaften
BGV A1	• Unfallverhütungsvorschrift "Allgemeine Vorschriften"	• Regulations concerning the Prevention of Accidents (General Regulations)
BGV A6	• Unfallverhütungsvorschrift "Fachkräfte für Arbeitssicherheit"	• Regulations for Safety Engineers concerning the Prevention of Accidents
BGV A7	• Unfallverhütungsvorschrift "Betriebsärzte"	• Regulations for Occupational Physicians concerning the Prevention of Accidents
BPersVG	• Bundespersonalvertretungsgesetz	• Federal Employee's Representation Act (Civil Service)
CIP	• Continuous Improvement Process	• (KVP) Kontinuierlicher Verbesserungsprozess
CP	• Code of Practice	• Arbeitswissenschaftliche Erkenntnis (AE)
DIN	• Deutsches Institut für Normung	• German Institute for Standardization

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4 SAMMELORDNERN

Arbeitswissenschaftliche Erkenntnisse

Forschungsergebnisse für die Praxis

mit allen bisher erschienenen Ausgaben

Anrecht auf Nachlieferung an die Abonnenten

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