



**MINISTRY OF SOCIAL AFFAIRS AND
HEALTH
DEPARTMENT FOR OCCUPATIONAL
SAFETY AND HEALTH
FINLAND**



**ILO SAFEWORK –INFOCUS
PROGRAMME ON SAFETY, HEALTH
AND THE ENVIRONMENT**

The Economics of Health, Safety and Well-being

BAREFOOT ECONOMICS

**Assessing the economic value of developing an healthy work
environment**

A publication based on the joint project between the Finnish Ministry of Social Affairs and Health and ILO- SafeWork programme in close collaboration with an international expert working group

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PREFACE

The purpose of economic activity is to increase the well-being of individuals and enterprises in the same way. This is a fact that we sometimes forget when we are talking about work environment development. A traditional approach where improving health and safety at the workplace is seen as an additional cost has slowly been replaced with an approach where workers' health, safety and wellbeing become integral parts of the economic sustainability and organisational development of enterprises.

By linking health and safety issues with managerial and developmental issues, a growing number of successful enterprises show that it is possible to develop the work environment combining workers well-being and company profitability in balanced way.

The objective of *Barefoot Economics* is to provide a practical evaluation tool to entrepreneurs and all those actively involved in the decision making within enterprises, to meet this challenge by creating healthier and more productive workplaces. An attempt to present practical tools of a different type is given in this publication.

This publication has been drawn up by the Department for Occupational Safety and Health of the Finnish Ministry of Social Affairs and Health with ILO Safework -programme in co-operation with international group of experts. The expert group have made valuable comments on the publication in the different stages of the drafting. The list of the persons involved in the work can be found at the end of the book.

ILO Safework-programme aims to create awareness of the dimensions and consequences of work-related accidents, injuries and diseases, to place the health and safety of all workers on the international agenda, and to support practical action at all levels. The strategy for better safety, health and environment aims at showing that protection pays and asks for better information and tools for this purpose.

The potential benefits of workplace level actions such as enhanced productivity, quality and cost savings, are an important part of this process. Safework will emphasize that the social and economic impact of improving workers' protection, the cost to society, as well as the potential benefits of protection are essential to realise also at the workplace level.

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1. INTRODUCTION

The purpose of a company is to manufacture products or offer services for which there is demand in the market. Companies choose the most economical of the technically feasible alternatives to manufacture products. Management's function is to make decisions on every level of this process that determine the future course of action for the organisation over the short and long term. The working conditions where this activity takes place is one of the key elements.

Accidents and work-related illnesses can be considered as adverse effects of this process. There are lots of case studies of companies that have reduced these costs through the development of working environment. The economics of the working environment tries to provide information of these costs and benefits related to this process and by doing so, to encourage behaviour, which will develop the safety and health level of the organisations.

The operation activity of a company is controlled on the basis of financial information. It is also equally important to supply information of the economic implications of the working environment. In many cases it is possible to evaluate the cost of accidents, absenteeism and disability pensions from the company point of view. Bad working conditions can effect the performance of a company by increasing the expenses and lowering the profitability. But, on the other hand, good working conditions can boost the productivity and decrease company expenses. The value of occupational safety and health to a company's bottom line cannot be overstated.

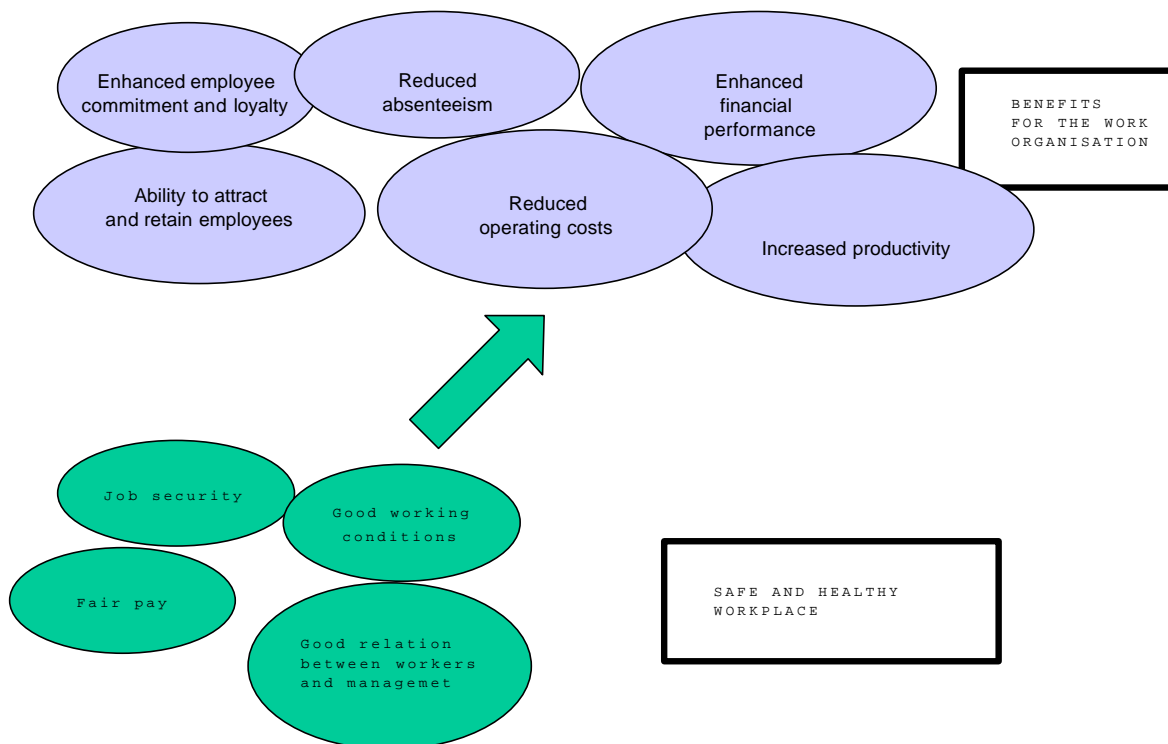
Often more significant are the profits that the development of working conditions and improvements in production control result in. These impacts are seen as reduced interference of the production, reduced production losses, increased productivity and quality. All these improvements have a further effect of improving worker motivation and well-being, thus making enterprises safer and more competitive. If a company has a poor safety practice, then even small investments may have major payoffs. It seems that the development of work organisation and ergonomic interventions may be the most profitable ones.

2. THE BENEFITS OF GOOD AND HEALTHY WORKING CONDITIONS

Competition requires enterprises to foster innovative, diverse, and flexible workplaces. In addition, consumer and investor groups are increasingly holding companies accountable for creating fair, productive, and empowering workplaces. Companies are crafting innovative workplace policies and practices that closely reflect and respect the needs of all employees in order to meet core business objectives.

Several studies demonstrate a positive relationship between company workplace practices and business success. These studies highlight workplace policies that demonstrate respect for employees basic requirements: good external working conditions, job security, good relations between management and workers and fair pay and employee motivation. When these basic requirements are met, the company can focus on improving factors like productivity and operational efficiency. First step towards improving these aspects is to create an open and innovative working climate, where sharing responsibilities and showing confidence in employees is essential.

Recognition and feedback for work results and opportunities for learning and personal growth have strong influence on an employee's job performance and workplace commitment. If the company can encourage employees to create and share their knowledge, it can result in cost savings and improved performance. Contrary to traditional management styles, which rely on "line of sight" to maintain productivity, a work culture based on motivation encourages employees to take responsibility in their decision making. Companies with these kind of policies are actually experiencing increase in the safety level, productivity and business performance.



Picture 2.1 Safe workplace and its benefits for the work organisation.

3. HOW TO EVALUATE THE COSTS AND BENEFITS OF IMPROVING THE WORKING ENVIRONMENT?

How can you take simple and effective action, which will raise productivity while improving workplace conditions? Improving work organisation to be more effective or work environment are good ways to increase productivity, especially since they can often be done without huge capital investments. However, it is not always easy to estimate the costs and especially benefits that follow from these actions.

In recent years a number of methods and tools for assessing the costs and benefits of occupational health have been developed. One easy way to demonstrate the costs and benefits of improving the working environment is the "Balloon model". The model is developed by Ulf Johanson and Anders Johrén (Johanson- Johrén 1993)

The idea of this model is to describe cost and benefits of a investments in a figure, where one part of the figure is representing the cost side of the investment and other part is representing the benefit side of the case. In the following example, this method is applied to a workplace development project.

The model step by step

1. First identify the problem, objective, or investment, the economic effects of which you wish to evaluate. Also determine the cause of problem.
2. Consider various measures that can be taken to remedy the situation of to improve the working conditions.
3. Describe the effects of each measure. As an aid, you can use a diagram where the costs of the projected improvements are entered under a horizontal line and the positive effects of benefits above it. For clarity's sake, the figures could be placed in balloons to depict the causes and effects as tangibly as possible.

3.1 Improving the kitchen ventilation (Ministry of Social Affairs and Health, 1998)

STEP 1. Definition of the problem

The first step is to identify the problem, development objective, or the investment, the financial impact of which is to be evaluated. Next, determine the cause of the problem.

The air-conditioning system of a restaurant kitchen was found to be ineffective. Air quality was poor and temperatures sometimes reached 40 °C. The problem were caused by the increase in the number of stoves which exceed the capacity of the AC system. Moreover, the direction of flow of inlet and outlet air was incorrect. For example, fresh replacement air entered the room above the stove while exhaust air was drawn from behind the employees working at the stove.

STEP 2. Identifying optional courses of action

Consider various measures that can be taken to remedy the situation or to improve the working conditions.

Ventilation of the kitchen can be improved by relocating staff work positions to ensure that the directions of airflow are correct. However, it is not necessary to replace the AC system; instead, efficiency can be improved by modifying the existing system and servicing it properly.

STEP 3. Describing the consequences of proposed measures

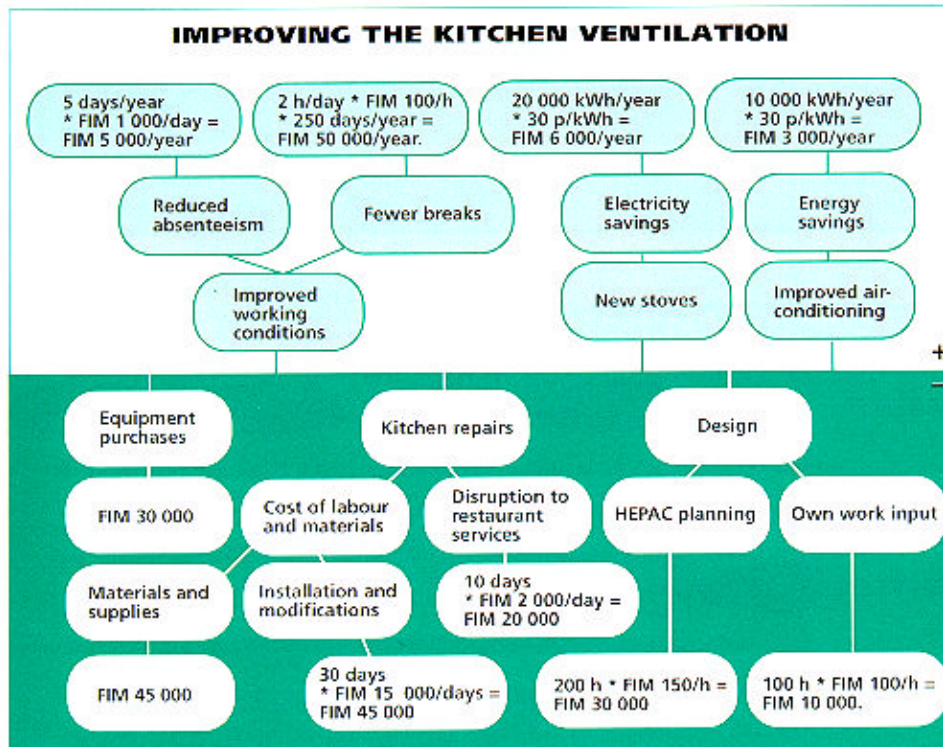
At this point, the effects of each contemplated measure are described. To illustrate these, use a diagram where the cost of the improvement is entered under a horizontal line and the positive effects of benefits above it. For clarity's sake, the figures could be placed in balloons to depict the causes and effects as tangibly as possible.

Costs are incurred by the modifications made to the AC system and its layout as well as material purchased and the work involved. To reduce the air temperature, a decision was made to replace the stoves with new models that did not dissipate so much heat. To evaluate total costs, disruption to the normal workings of the restaurant must also be considered.

As a result of improved indoor air quality, the numbers of work breaks and sick days decreased. It was estimated that because of the heat, the two kitchen workers had to take numerous work breaks totalling two hours every day. When cooling off outdoors, they were liable to catch cold. The reduction in the number of sick days as a result of the modifications to the AC system was assumed to be five days. Additional benefits were gained in the form of lower electricity consumption and other energy savings.

STEP 4. Costing the improvements

When the inputs and outputs of the measures have been defined in as great a detail as possible, they can be costed. They need not be exact figures: what is important is to evaluate the order of magnitude of the costs and benefits.



STEP 5. Input-Output analysis

Compare the inputs required for implementation with the benefits achieved and calculates the pay-back period. If the cost or benefits are distributed over several years, an investment calculation needs to be made by computing annual depreciation or return.

Cost of improving the air-conditioning system

Design (HPAC design + own work input)	FIM 40 000
Work and materials	FIM 90 000
New equipment	FIM 30 000
Disruption to restaurant services	FIM 20 000
TOTAL	FIM 180 000

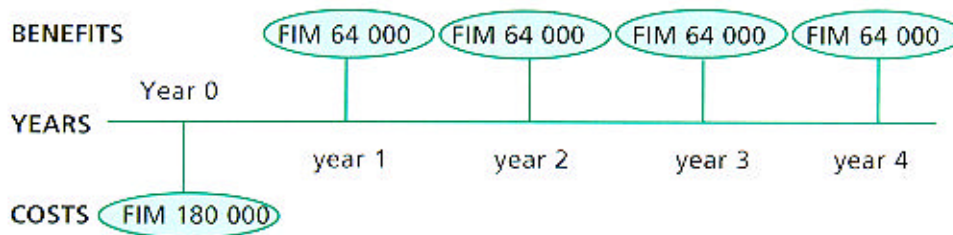
Benefits offered by modifications to the air-conditioning system

Decrease in the number of work breaks	FIM 50 000
Fewer sick days	FIM 5 000
Electricity savings	FIM 6 000
AC energy saving	FIM 3 000
TOTAL	FIM 64 0000

The cost-benefit analysis is a procedure for making long-run decisions such as whether to improve the ventilation or build a factory. The correct way to make a decision is to compare the present value of the costs with the present value of the benefits. The action should be taken only if the present value of the benefits exceed the present value of costs.

Another simple method to use is the pay back-method. The method simply states how long does it take when benefits cover the costs of the investment.

INVESTMENT CALCULATION



The pay-back period for the investment can be calculated as follows:

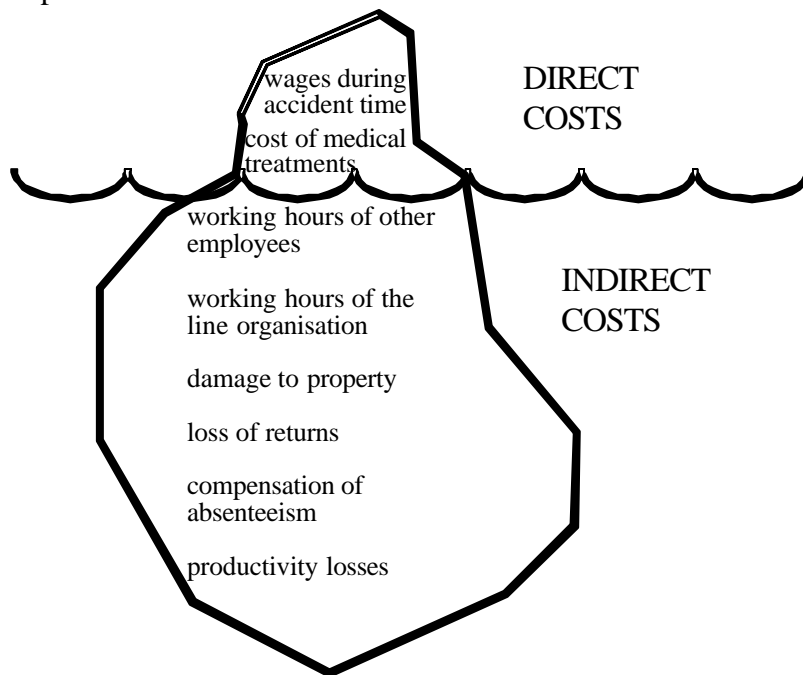
$$\frac{\text{Investment cost}}{\text{savings or benefits per year}} = \text{pay-back period}$$

$$\frac{\text{FIM 180 000}}{\text{FIM 64 000/year}} = 2.8 \text{ years}$$

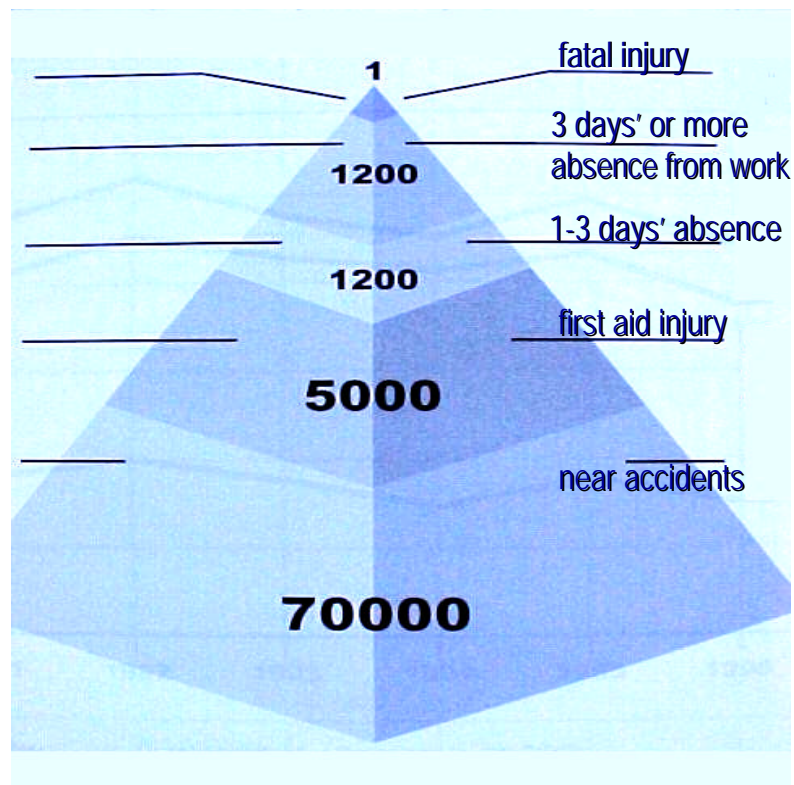
4. EXAMPLES OF ECONOMIC EFFECTS OF WORKING ENVIRONMENT

4.1 Accidents costs

There are many ways to categorise and describe the cost effects of occupational accidents. We can look the costs of accidents from the victim's, company's or society's point of view. Also the meaning of different cost items are undefined. H.W.Heinrich developed in the 1920's a so-called iceberg theory. According to this theory he divided a company's accident costs into direct and indirect costs. Direct costs of accidents are caused by the payroll costs for period of absence, medical care and medication costs and other costs that are immediate consequences of the accident itself. Indirect costs of the accidents are other costs that are caused by the accident. They are for instance loss of working hours concerning others than the injured, losses of property and output due the accident and lost company image, legal expenses and fines etc.



Heinrich paid attention to the fact that a lot of accidents in companies do not cause losses of health. He invented the so-called accident triangle theory according to which a lot of minor accidents happen per one accident causing disability to work. His calculation model, however, did not take into account sheer material damages. The accident triangle theory is still in common use. The theory is based on study, which indicated that towards each over 3-day injury accident occur great amount of minor injuries and non-injury accidents. Picture 4.1.1 outlines the current situation in Germany (Steinbruchberufsgenossenschaft 1997).



Picture 4.1.1 Distribution of the accidents according to consequences in Germany (Steinbruchberufsgenossenschaft 1997)

There are a lot of theoretical models for calculating accident costs, but only a few which can be put into practice. The models of accident cost usually contain long checklists in which all possible consequences of an accident are taken into account. However, from the companies' point of view it is more important to concentrate on consequences which are more significant and easier to assess, than trying to achieve an accident cost as exact as possible. The focus should be in the minor injuries and other accidents. The economic consequences from these kind of accidents are usually underestimated. The companies and workers can benefit from better information on these costs.

One way to assess these costs is to divide them into direct and indirect costs. Direct costs consist of payroll cost for period of absence, medical care and medication and other costs, which are obvious results of the accident. By contrast, the indirect costs of accidents are for example material damage and other cost which are indirect consequences of the accident. From these total costs the compensation received from the accident insurance must be deducted. At the end of the publication there is an example calculation of transportation accident and its cost to the enterprise.

Figure 4.1.2 Cost elements of occupational accidents

COST OF ACCIDENT AT WORK			
DIRECT COSTS	<i>Hours</i>	<i>\$ / hour</i>	<i>Total</i>
Wage costs on the day of accident			
Wage costs during the absence			
INDIRECT COSTS			
Replacement of absence			
Overtime			
Cost of replacement workers			
Other personnel costs			
Reorganisation of work			
Accident investigation.			
Assistance, first aid etc			
Damage to property			
Raw materials and semi-finished goods			
Tools, machinery etc			
Disruptions of production and cost of downtime			
Delays in deliveries and penalties			
Other costs			
Impact on insurance premiums etc			
DEDUCTIBLE			
Compensation by the insurance company			
TOTAL GROSS COST OF ACCIDENT			
- Normal wage costs without absence			
NET COST OF ACCIDENT			

4.2 Cost of absenteeism

Analysing the impact of sick days on costs is an important issue. Usually the most obviously measurable costs i.e. wages during absence can be monitored in companies. However, these costs do not give the right picture of the level of costs during absence. A lot of indirect costs are related to absenteeism.

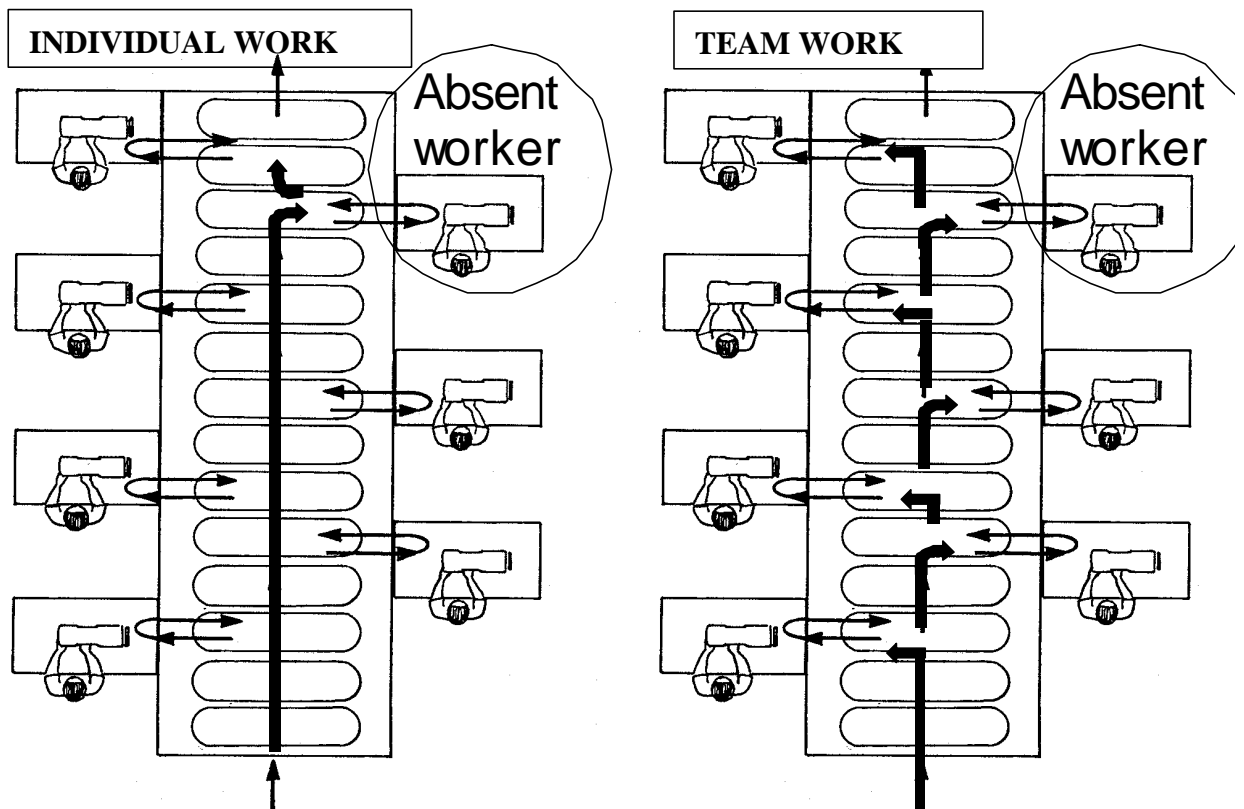
Available work input is reduced by absence. The value of this lost work input can be measured by means of wages during absence. What determines the formation of costs, however, is the impact of the reduction of work input on the organisation's operations. Usually the input of the absent employee has to be compensated somehow: recruitment of replacements, overtime or maintenance of over-capacity. In some cases the lacking input can be seen in the result i.e. sales and production losses. The problem is to measure these costs and allocate them on absence because e.g. overtime time work and disturbances in production also occur for other reasons than absence due to sickness.

How serious the impact of absenteeism is, depends largely on the production capacity's degree of use and the way the production is organised in the company. If only a part of the capacity is in use, making use of more capacity i.e. by reassigning work to other employees can compensate absenteeism. The way that production is organised also effects to the costs.

Two production systems – different kinds of cost effects

There are two general ways production is organised. Sometimes workers work side by side each but independently. An example would be seven workers at seven sewing machines, each worker manufacturing all the pieces required for a garment. In this case, worker being absent costs the enterprise the value of his or her wage plus the extra costs for this idle work station (machine rental etc.).

A different sort of organisation is one in which the work passes from one person to another in team fashion. This would be the case in our garment enterprise if one worker cut a piece of cloth, another trimmed it, a third sewed it to a second piece, and so on. In this second situation, if one worker is unexpectedly absent, it interferes with the productivity of every other worker in the team. To calculate costs in this situation, in addition to the cost of the absent worker's wage we have to take into account the lost production of everyone else. We could approximate this by guessing the fraction of the work that breaks down and then taking this fraction of the whole team's combined wage. So if we think that one-fourth of the work is lost while the absent worker is out, we would calculate the cost as one-fourth of the sum of all the wages paid to everyone whose work is connected (see next figure).



INDIVIDUAL WORK			
- one worker performs all operations to manufacture the garment			
COST OF ABSENCE			
	<i>Hours</i>	<i>\$/ hour</i>	<i>Total \$</i>
Wage costs on the absent worker	8	10	80
Part of fixed cost of production			5
Total cost of absence			85
TEAM WORK			
- worker pass the garment from one stage to the next one			
COST OF ABSENCE			
	<i>Hours</i>	<i>\$/ hour</i>	<i>Total \$</i>
Wage costs on the absent worker	8	10	80
Part of fixed cost of production			5
Part of teams total wage sum (6 persons x 80 \$ x 1/4 = 120)			120
Total cost of absence			205

Figure 4.2.1 Production structure and its impact on absence costs

The starting points mentioned above have to be considered when calculating costs of absenteeism due to sickness. It is not always possible or practical to develop exact systems for cost estimates, because the impact absenteeism has on costs varies from case to case. It is more reasonable to estimate figures that describe the average situation of the organisation (e.g. the price of a sick day) and use these as calculation parameters for measuring costs.

Costs due to absenteeism can be estimated as follows:

COST OF ABSENTEEISM			
DIRECT COSTS	<i>Hours</i>	<i>\$ / Hours</i>	<i>Total \$</i>
Wages paid during sick leave			
INDIRECT COSTS			
Additional production costs			
Quality losses			
Loss of production			
Additional payroll costs			
Replacements			
Overtime work.			
Administrative costs			
Work re-organisation			
Recruitment of replacements			
Other costs			
Disruptions of production and cost of downtime			
DEDUCTIBLE			
Compensation by the social insurance			
GROSS COST OF ABSENTEEISM			
- Wages without absenteeism			
NET COST OF ABSENTEEISM			

Figure 4.2.2. Costs of absenteeism due to sickness from the company point of view

Salaries and wages during absenteeism are the basis of the calculation of costs due to absenteeism. When indirect costs due to absenteeism are added, the result is gross costs of absenteeism. However, it should be noted that attendance also costs money. To arrive at the net cost of absenteeism, regular payroll costs must be deducted from this amount.

From the point of view of developing working conditions, it is advisable to monitor absenteeism. Acknowledging the price of a day of absence is useful when investments for improvement of employees' health are motivated. Using this data, the employer, employees and safety officers can learn about the work environment and its potential effects on health. But at the same time it must be stressed that the reasons for absenteeism are numerous and effected by a number of background variables. Some of the cases are unavoidable, and it is not in anybody's interest to force employees to come to work when they are sick.

The important thing is that the employees are engaged in a productive, high-quality work. Instead of trying to reduce absenteeism, it is advisable to make efforts to improve attendance. For instance, factors that improve attendance include the development of the work environment, making the work more interesting and challenging and stressing the importance and role of the individual worker.

4.3 Turnover and new recruitment

Due to high cost of recruiting and training new employees, companies increasingly are working to keep their current employees on board. The quality of the working conditions have become a means of attracting employees, especially in sectors facing a shortage of skilled workers. Staff turnover is one measure of the workplace atmosphere.

Human resources professionals were asked in a recent study to estimate the costs of replacing employees in management and no-management positions. Their estimate included the cost of advertising, travel, interviewing time, lost productivity (due to the vacant position), and other associated expenses. On average the cost of replacing a manager was three times the cost of replacing a non-manager. It has been estimated that the cost of replacing an employee ranges from 29 to 46 percent of the person's annual salary (Bernthal-Wellins 2000).

The employer incurs expenses both for the recruitment and termination of the employment. These expenses vary depending on the type of work and workplace as well as on a case-by-case basis. It is important to investigate turnover figures and expenses to be able to make decisions on long-term personnel policies.

Figure 4.3.1 Example of the cost of staff turnover (Johanson - Johrén 1996)

Cost	Worker / FIM	Office staff / FIM
Administrative hours	2 400	2 400
Work supervisors and line management hour	1 200	1 800
Interviews and selection	6 000	9 000
Orientation of a new worker	14 400	108 000
Guidance of a new worker	14 400	48 000
Loss of productivity during orientation and training	15 000	34 200
TOTAL	53 400	203 400

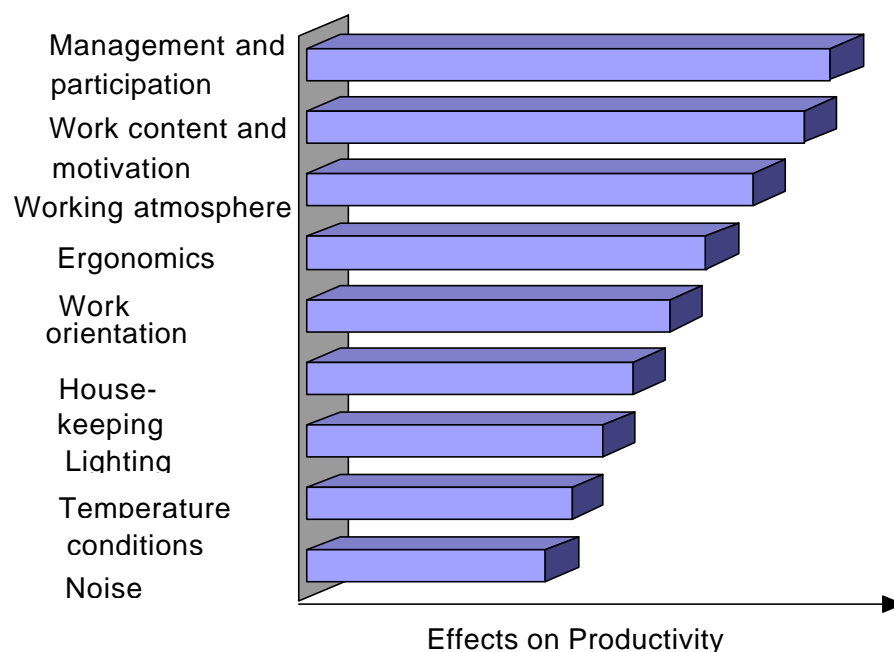
Turnover is not always a negative matter. Changing jobs is a natural part of the career development. The expansion of the company or new assignments can create need to hire new employees. Turnover can create costs if the turnover of employment is high and the company is obliged to replace the experienced employees with new ones.

It is a common belief that workplace development programmes help significantly in recruiting efforts and contribute measurably to employee perceptions that the company is a "good place to work". There is also a moderate but significant correlation between an employee's job satisfaction and intention to leave (Bernthal-Wellins 2000).

Flexible work arrangements encourage employee retention and usually the low turnover rate is due to some workplace characteristic; unlimited sick time or days off to be home with a sick child, workout facilities or bonus and profit-sharing programs.

4.4 Workers well-being and company performance

It is quite obvious that the workplace, personnel's proficiency and work organisation effect the performance of the company. It is more cumbersome to say which things have the highest impact on the performance of the company and what kinds of combinations have the greatest effect on the results. In a Finnish study where the productivity factors of SME's were investigated it turned out that issues like management, employee participation, content of the work and employee motivation had the greatest effects on company's productivity.



Picture 4.3.2 Work environment improvement and productivity

In an other Finnish study, personnel's high work ability, work satisfaction and organisational commitment had a positive association with workplace success, but in successful workplaces personnel had a higher amount of exhaustion, but the relation was rather weak. Variables describing personnel well-being had a very similar effect on success in metal industry and retail trade, and also in workplaces of different sizes. Some statistical significant interactions were found between variables of personnel well-being. Personnel well-being seems to be one factor in the company performance, but different dimensions of well-being seem to effect performance as a complicated interactive network (Jurvansuu et. al 2000).

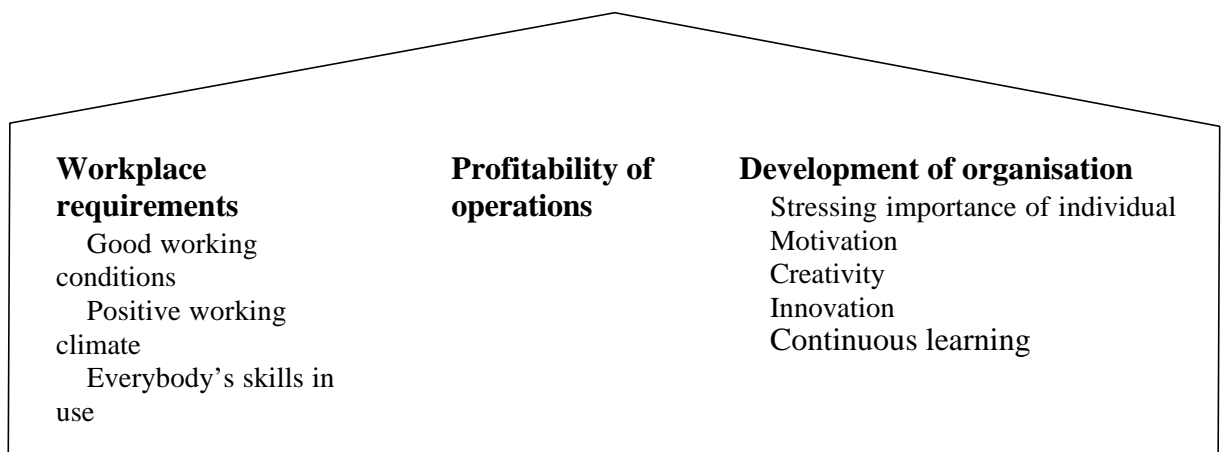
While in many countries the economic boom has continued for some years, unemployment remains still high, workers experience stress and long sick leaves or are forced to retire early. It seems that increases in productivity and employment along traditional lines cannot be achieved without new ways of thinking.

Furthermore, many of the tried remedies to boost lacking competitiveness have increased work intensity, but have not met the competitiveness requirements of even the immediate future. The increased pace of work is not only claiming a human toll but is also having a detrimental effect on the quality of operations and business. New organisational approaches are needed to save companies and jobs, and to enhance employee's well-being.

The current trends may be reversed through pursuit of an innovative and sustainable form of work organisation. Promoting competitive and sustainable growth is major theme in many countries in Western Europe. The idea of sustainable work is based on regeneration of human and social resources. A sustainable workplace takes into account the human and social results of the operation as well as the economic results. In sustainable work systems resources are not consumed, but allowed to grow. Employees are not confined to an high-paced work and meaningless work reality, instead they are allowed to learn and develop, to use their intelligence and creativity, to collaborate and participate. By acknowledging work performance and giving feedback for results, a company can increase personnel's trust in the success and the future of operations (TCO 2000).

Equally important for personal well-being and for socio-economic development is an employment policy that ensures access to work for everyone and enables individuals to sustain themselves and their families by their own work. Particularly in developing countries the health and well-being of the family is critically dependent on the health and productivity of its working member, thus making several members of the community dependent on the health of the worker.

Picture 4.3.3 Key factors in sustainable work organisation



4.5 New risks in work life

4.5.1 HIV /AIDS (BSR Education Fund 2000)

Social considerations have been the principal motivating force for business response to HIV/AIDS, but economic factors are assuming ever greater importance. Some developing countries, particularly in Sub-Saharan Africa, are experiencing devastating effects from the prevalence of HIV/AIDS, placing business operations, market opportunities, and economic growth at serious risk.

Companies are responding to the challenges posed by these circumstances by building coalitions and entering into partnerships with other organisations. The spread of HIV/AIDS in world-wide makes it very likely that few, if any, companies will escape its impact. As the epidemic progresses, an ever-wider sphere of business operations is being affected. Emerging signs of long-term, negative economic effects of HIV/AIDS suggest that business opportunities for growth in many areas of the world may be constrained if steps to harness the epidemic are not taken.

Company-sponsored HIV/AIDS prevention programs in their workplaces and local communities help reduce the accumulated costs and extent of the epidemic. Those companies choosing to implement HIV/AIDS policies, offer training and education to their employees, provide support to employees with HIV/AIDS, and contribute to multisectorial efforts to prevent infection or mitigate further harms will experience various effects, including the following:

Improved employee morale: The most immediate reported benefit of workplace HIV/AIDS education is rising morale. In addition to providing information that allays fears and offers guidance on preventing infection, such programs are a sign that employers seek to be knowledgeable about the issues and care about their employees

Increased productivity: In the late 1990s, the National AIDS Fund reported that the United States was estimated to be losing over \$1.8 billion in productivity each year due to the absence of individuals with HIV/AIDS from the workforce. At the workplace level, increased absenteeism, the loss of employees and their skills and knowledge, the need to invest in training replacements, and declining morale negatively affect productivity. According to a UNAIDS report issued in 2000, the manager of a sugar estate in an African country reported that 8,000 days of labour were lost to HIV/AIDS between 1995 and 1997. They also reported that between 1993 and 1997 there was a 50 percent drop in processed sugar recovered from raw cane.

Decreased costs of health care: The health-care and related costs incurred by companies having employees with HIV/AIDS can be a significant burden, particularly in areas where incidence of the disease is high. For example, a USAID-funded study of a transport company in Zimbabwe estimated the cost to the company of HIV/AIDS as equal to 20 percent of profits, half of which were due to higher health-related costs. Companies that have the resources to supply counselling and health care services to employees with HIV/AIDS can also reduce the costs of the illness.

Lower rates of employee turnover: Company efforts to prevent HIV infection and to support employees with HIV/AIDS will reduce the rate of employee loss due to this disease. The costs of turnover, including lost productivity, can be high, equivalent in a U.S. firm to as much as one-half to one year's pay for each person needing replacement. In addition, there are the immeasurable costs resulting from loss of tacit knowledge.

4.5.2 Stress at work

Stress is complex phenomenon, which is reflected, in the large number of definitions in circulation. Stress usually is defined as an interactive psychological process or a psychological state between the individual and the situation (Di Martino 1992).

All of us are affected at one time or another by work-related stress. Although occupational stress is by no means a new phenomenon, it is becoming increasingly globalized and affects all countries, all professions and all categories of workers, including both blue and white-collar workers, as well as families and society in general. While stress at work is most frequently considered in the context of the industrialised countries, workers in developing countries are also undoubtedly affected. (ILO Safework 2000)

Some attempts have been made in recent year with regard to the costing of occupational stress at work (Cooper et al 1996, Hoel et al. 2000). The costs to the organisations are primarily related to sickness absenteeism, reduced productivity, replacement costs and additional retirement costs. Also a potential public loss of goodwill towards the organisation may be quite remarkable in some cases.

As part of an ongoing effort to invest in the well-being of employees and maximise their productivity, many businesses are developing and expanding health and wellness programs. In the past, such programs focused primarily on providing medical insurance and first aid, and on reducing the incidence of disease transmission within the workplace. Today, companies are expanding their definition of health to encompass a broader definition of physical and mental wellness. As a result, many firms are providing a broad range of services to meet employees' diverse and changing health needs. Many such programs are rooted in the recognition that prevention is a key cost-saving strategy. The growth of these programs can be attributed to a number of factors, including a desire by companies to reduce costs, attract and retain valued employees, and align business practices with the firm's core values.

These stress prevention programs often yield quantifiable bottom-line benefits to companies through higher productivity and significant cost-savings resulting from reduced absenteeism, lower health-care costs, and reduced worker compensation costs. These programs also have contributed to employee retention and commitment.

Stress management programme in insurance and financial service company (Rick et. al 1997)

An insurance and financial service organisation with employees largely based in the UK has adopted a flexible approach to stress management. The company employs 13 000 people in five businesses and two support operations. Recent business trends, such sift towards telesales, the global marketplace an a long-term drive to cut costs, have made people fee insecure. Many have lost their jobs, and more fear that they will.

The company's approach to stress management is base on solving problems to meet individual needs and offering a clear company policy on stress at work.

The key elements are:

- making it acceptable to talk about stress within the organisation
- making specialist help available through a counselling service
- identifying problems in different parts of the organisation an working to overcome them

- making it clear to individuals what they can do about environmental influence that can cause stress

The organisation is changing some of its internal auditing processes (such as records of sickness absence) to give an accurate picture of staff health. The feedback from what they have already achieved will be used to help influence the stress management strategy in the future.

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6. ANNEXES

6.1 Occupational Safety and Health Improvement and Productivity In Small and Medium-Sized Enterprises Program in Thailand (NSC 2000)

by Sudthida Krungkraiwo

I. Introduction

Thailand has developed quite rapidly from agriculture to a more industrialised country. New modern technology, advanced machinery, and new chemical substances have been introduced into the industry and are used increasingly. At the same time, available statistics from the Workmen Compensation Fund indicated that the number of industrial accidents and occupational diseases is increasing too. Therefore, protection of workers from hazards in the workplace is an urgent priority to be dealt with.

To protect workers against industrial injuries and occupational diseases and to provide workers with better working conditions and living standards, the Royal Thai Government established the National Institute for the Improvement of Working Conditions and Environment (NICE) in 1983, as a division of the Department of Labour, with assistance of UNDP/ILO.

II. Occupational Safety and Health and Productivity

Small and medium-sized enterprises (SMES) play an important role in development of the country due to their high percentage, more than 90% of all enterprises in Thailand. Despite their importance, many SMEs fail to grow or even survive; they also have to face a great deal of problems.

One of the major problems is that SMEs are often characterised by very unfavourable working conditions. Work tends to be dangerous and arduous. Several studies have been carried out that demonstrate that the general level of working conditions is very poor and

that exposure of workers to hazards is much higher in SMEs.

A survey indicated that most SMEs urgently needed improvements in order to protect the workers from occupational hazards and provide basic welfare facilities. Working conditions and environment in SMEs tended to be inferior compared to larger enterprises.

Moreover, it is widely recognised that there are difficulties in applying laws and regulations on working conditions in SMES, so they are sometimes exempted from legislation.

III. Methodology Approaches for SMEs

SMEs are facing a series of problems in their struggle for survival and development of their business. They do not have the financial resources to overcome problems as larger enterprises have. They are thus constrained to use resources at hand to improve their enterprises.

Recent ILO experience has demonstrated that there are a number of practical and effective measures that can be taken to improve OSH in SMES. Based on several years of field work using a new training methodology, the ILO developed a training technique called WISE (Work Improvement in Small Enterprises) to approach SMEs and publishing a training manual entitled "Higher productivity and a better place to work." The training approach is trying to conceive by focusing on low-cost and simple improvements, the relations between OSH and productivity and other management goals, local achievements. WISE training technique has been found effective in improving OSH and productivity at many workplaces.

Table 1
SMEs

	Number of injuries		
	1995	1996	1997
(1) Wang Thai Industry Co, Ltd. with 115 workers	32	13	10
(2) Charoen Can Industry Part.Ltd. with 24 workers	22	3	1
(3) Thai Roong Ruen Karn Chang Factory with 54 workers	15	3	2
(4) D.N.P. Metal Work Part.Ltd with 15 workers	11	3	0
(5) Por Thong Poon Payon Factory with 20 workers	4	3	2
(6) Ching Mong Ngun Part.Ltd. with 28 workers	3	0	0

Table 2

Working Conditions Before Improvement	Improvement	Benefit	Cost
Moving part of the pressing machine without guard can injure workers.	Build guards for pressing machines	Machine guards can eliminate hazard.	5,000 Baht (For 20 pressing machines) (111 \$)
Leaving materials around in the production area that reduce the space available for production operations.	Save space by making horizontal storage rack	Good housekeeping can save more space for production operations and makes it easy to access.	No cost of improvement because workers can use the material in their own factory but not in use.
Placing the material on the shop floor and not in order.	Provide multi-level storage rack for different material.	Savings in floor space and improved inventory control.	No cost of improvement because workers can use the material in their own factory but not in use.
Leaving tools, equipment and materials around in the production area. Workers spend valuable time looking for things.	Provide tool storage for each tool and work item and draw outline of each tool on the board.	Tool storage is easy to control inventory and to find the required tool quickly.	No cost of improvement because workers can use the material in their own factory but not in use.
Tools don't have 'homes,' workers lose time searching and may not use the right tool.	Provide place for tool and keep item in order.	Provide a 'home' for each tool, can prevent time loss for finding and use the right tool at all times.	No cost of improvement.
Workers have to bend and twist their bodies to reach material that placing on the floor and will be the major cause of back injuries and shoulder disorders.	Provide table for placing material with the same level working height and easy to reach.	Eliminate bending and twisting. Workers can work comfortably that will bring to productivity.	200 Baht (4\$)
Poorly cleaned light source can reduce lighting and poor quality work.	Well-maintained and clean windows and light source once a month regularly.	Good lighting can lead to higher productivity and efficiency.	No cost of improvement
Bad lighting leads to low productivity and poor quality as well as eyestrain, fatigue and headaches for the workers.	Install a few roof panels with translucent plastic to increase daylight.	Using daylight reduces energy costs and also can help to improve the efficiency and comfort of workers.	700 Baht (16\$)
No washing room for workers to wash their bodies after using chemical products that may cause sickness.	Provide 2 washing rooms, one for male workers and another one for female workers.	Personal hygiene can reduce health hazards when workers expose to dust or chemical products and also hazardous substances will not spread to their home and family.	20,000 Baht (444 \$)
No rest areas for workers during rest breaks.	Provide rest area with sitting facilities for workers during rest break.	Good rest area can help workers to reduce fatigue. And get ready for continued productive work.	6,000 Baht (133 \$)
Hot environment may increase workers' fatigue and reduce efficiency.	Install ventilation equipment on the roof to increase natural air flow.	Increase airflow will make workers feel comfortable and increase productivity.	5,000 Baht (111 \$)
Without clearly marked transport areas, walking routes and storage areas, etc., may obstruct transport, production and also cause accidents.	Draw lines to separate transport ways, walking ways, and storage areas.	Clear and mark transport routes with easy access to worksites and storage areas can help to achieve a better workflow as well as to ensure safe and quick transport.	1,000 Baht (22\$)
Difficult to reach fire extinguisher.	Change the place for installing fire extinguisher and maintain good housekeeping.	In case of fire, easy to see and reach fire extinguisher.	No cost of improvement.
Fire extinguisher installed not correct according to the law.	Place fire extinguisher in the correct place and also put sign and mark on the floor 'Don't place anything here.'	In case of fire, responsible workers can reach fire extinguishers easily and quickly.	No cost of improvement.

NOTE., 1 U. S. Dollar = 45 Baht (approximate), February 1998

6.2 Cost of the transport accident in Small Engineering Workshop (Ministry of Social Affairs 1997)

A heavy metal beam fell off a bridge crane during transport, hit the floor and landed on the foot of an employee. He was put on the sick-list for two months with a broken ankle.

The absence from work totalled 310 hours, of which 4 hours occurred on the day of the accident. The wage cost per hour worked was FIM 100. The employer received FIM 21 000 in compensation for wage costs under the accident insurance.

The work input lost during the sickleave could be partly compensated for by redistributing work within the company. In addition, absence was estimated to result in 40 hours of overtime. The wage cost of one hour of overtime was FIM 150. The cost effect of the overload was estimated to be FIM 50 per hour.

The middle management and occupational safety officer spent a total of 10 hours investigating the accident and reorganising work. Clearance of the accident site and assisting the victim took a total of 12 hours.

The metal beam, which fell, was damaged beyond repair. Its value, inclusive of the cost of labour, was estimated at FIM 8 000. When falling, the beam crushed a welding machine worth FIM 50 000.

As a result of the fall of the beam, ten employees had to suspend work for about one hour.

COST OF THE ACCIDENT			
DIRECT COSTS	<i>Hours</i>	<i>FIM / hour</i>	<i>FIM Total</i>
Wage costs on the day of accident	4	100	400
Wage costs during the absence	306	100	30 600
INDIRECT COSTS			
Replacement of absence			
Overtime	40	150	6 000
Loss of production (work not done)	4	100	400
Loss of production (work carried out by others)	266	50	13 300
Other personnel costs			
Accident investigation.	10	100	1 000
Cost of clearing, repair and cleaning	12	100	1 200
Damage to property			
Raw materials and semi-finished goods			8000
Tools, machinery etc			50 000
Disruptions of production and cost of downtime			
Cost of downtime	10	100	1 000
Other costs			
Impact on insurance premiums etc			
DEDUCTIBLE			
Compensation by the insurance company			21 000
TOTAL DIRECT AND INDIRECT COSTS			90 900
Wage cost without absence	310	100	31 000
TOTAL COST OF ACCIDENT			59 900

NOTE., 1 U. S. Dollar = 6.9 FIM (Finnish markka) June 2001

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