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Risk Assessment: A Regulatory Strategy for Stimulating Working Environment Activities?

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ABSTRACT

This article analyzes the Danish approach to workplace assessment (WPA) following European requirements to establish legislation on occupational health and safety. Quantitative studies show that WPA can be interpreted as a success within the larger Danish firms. However, data from qualitative studies modify this picture by showing how attention has been focused on physical working environment problems while wider psychosocial problems have been ignored. The article claims there is no evidence from either the quantitative or the qualitative studies that WPA—even though positively evaluated—has become a recurrent activity within firms. © 2001 John Wiley & Sons, Inc.

1. INTRODUCTION

A central aim of human factors and ergonomics has been in "fitting the task to the man" in the pursuit of improved productivity and working conditions. Grandjean (Grandjean & Kroemer, 1997) uses this sentence as a title in his book, but the same approach can be found in many textbooks; for example, Murrell (1965) and Clark and Corlett (1984). Attention is given to work tasks; the technology of production; and the skills, experience, and assessment of the employees in the design and planning of new work arrangements. Besides better working conditions, it has typically been argued that such an approach will improve the functional operation of the system. Also the cost will be reduced compared to the total cost of a production system that does not consider the working environment. But in practice, at least in Denmark, such initiatives have generally not been able to fulfill these aspirations. Typically, attention to working environment considerations is taken after the production process has been established. These activities are aimed at repairing incorrect or inappropriate design of machinery, workplaces, and jobs (Clausen & Lorentzen, 1986; Kiil & Heide, 1986; Møller, Jensen, & Jensen, 1987). More recently, a number of proposals have been put forward with the aim of motivating management to promote working environment activities and establish preventive measures in the planning of production systems. This comprises economic motivators (Clinch, Convery, Fitzgerald, & Rooney, 1998), formalized management systems (Zwetsloot, 1998), and differentiated inspection strategies dependent on management performance in health and safety (Gunningham & Johnstone, 1998). In the 1990s, the regulatory initiatives from the European Union had been given special attention in Denmark.

In 1989, the Council of Ministers in the European Union passed a directive on the introduction of measures to encourage improvements in the safety and health of workers at work (EEC, 1989). This directive is not only focused on establishing traditional, specific demands to the design of machinery, workplaces, and jobs, but it also presents demands on organizational and procedural elements to be established by management. Central to this directive are demands on management to (a) undertake risk assessment and implement appropriate preventive measures, (b) establish contact with protective and preventive services to support the activities in the enterprise, and (c) consult workers or their representatives on any measure that may substantially affect health and safety.

In comparing the demands of national legislation in the EU directive with the contemporary Danish national regulation, the major element lacking in Danish legislation was an explicit demand for management to systematize and document risk-assessment and to establish appropriate preventive measures. This was addressed under the concept of workplace assessment (WPA). The aim of this article is to present and discuss the effects of introducing WPA as a mandatory demand for all Danish firms.

2. THE DANISH LEGISLATION IN PRACTICE

A short description of the Danish legislation and how it has been operating in practice has been given in the introduction to this issue. As stated, the intentions of the legislators can be described as, first, to insist on the requirement for employers to assure safe and sound working conditions. Second, to legitimate that a space for a discourse on working environment is set up within the firm between representatives from central interests involved. It was the expectation of the majority of the legislators that this would lead to preventive actions in firms, but as described, this expectation was not fulfilled. Instead, the safety organization and the working environment issue "came into the side-car" (Aminoff & Lindstöm, 1981; Jensen, 1995b).

Since the beginning of the 1980s, a permanent level in accident rates in the public statistics and a raise in the number of work related diseases has been registered on a national level (Direktoratet for Arbejdstilsynet, 1999). This has many causes, but the "side car functioning" of the safety organization and the working environment discourse has implied that no effective local actions have been established as expected. These findings were reported in the first half of the 1980s. By the mid-1980s, they were generally accepted as valid. Therefore, initiatives to remedy the situation were looked for. In this situation the social partners found the demand from EU on WPA as one tool among many for improving the situation.

2.1. Danish Regulation on WPA

As a first step in the implementation process, the demand for risk assessment was embodied in an executive order on the excursion of work from the Ministry of Labour (Direktoratet for Arbejdstilsynet, 1993). It was required that the planning and organization of work shall take into consideration the principles of prevention stated in the EEC directive (89/389/EEC), and that ". . . the assessment made shall be in written form if it has a certain importance to health and safety at work" (author's translation). The Labour Inspectorate submitted a guidance to elaborate how the demands could be fulfilled in practice.

During implementation, two issues were questioned in the public discussions: first, the scope of the demand for written WPAs, and second, the approaches to be used in carrying out a WPA. The first issue involved a discussion between the Social Partners (i.e., national labor market organizations and the Labour Inspectorate) with the employees' organizations advocating a general demand for written WPAs and the employers wishing to minimize such demands.

The second issue, the appropriate approaches to take, involved a broader debate with the labor market organizations, the Labour Inspectorate, the community of working environment professionals and firms. There was general agreement among most involved that WPA must not be professionalized (i.e., entrusted to experts typically coming from consultant firms and the Occupational Health Services [OHSs] using advanced, complex methods). In accordance with the general intentions of the law, all agreed that the involvement of management, employees, and their representatives were essential. But from this common ground different positions evolved. One group emphasized an approach focusing on local understanding and priorities of working environment problems. The labor market organizations (the confederation of unions of blue-collar workers and the organization of private employers) were distinct proponents of this position, emphasizing the importance of local motivation for and initiatives in the WPA process. The Labour Inspectorate was a leading proponent of another position. It emphasized that WPA had to cover all types of working environment problems and a systematic approach in the WPA process had to be followed. Its aim was to ensure that management and workers' representatives actually did address all aspects of the working conditions instead of just taking up issues defined by consensus or by old habits. These two positions can be seen as extremes in the discussion. Other groups tried to combine the two approaches (Høy & Jensen, 1996; Jensen, 1995b).

In June 1997, an amendment to the Working Environment Act was passed through parliament. Here the demands on WPA were clarified. It became the responsibility of the employer to ensure WPA is undertaken in cooperation with the employees. All WPAs have to be in a written form. Second, the WPA process was required to involve the following elements:

1. an identification and survey of the working environment in the firm with type and range of problems;
2. a description and evaluation of the working environment problems;
3. priority of problems found and an action plan for solving the problems, including the succession of when the problems are dealt with; and
4. instructions on activities to follow up the action plan, with a specification on who has the responsibility for following up.

Within these broad limits the firms still have the freedom to choose methods they find best suited. So the debate on approach had not been resolved by parliament but left for joint decision making in the firm.

To guide firms on how to comply with the first executive orders, a lot of material was published. Besides the advice from the Labour Inspectorate, the trade union congress for white-collar unions gave out a publication encouraging members to participate in the design of WPA procedures (Jensen, 1995b). The trade union congress for blue-collar workers and the employers' organization initiated a research project on WPA. Their first publication outlined 29 different tools for WPA (AMF, 1995). Finally, many unions, branch

TABLE 1. Firms behind the Sample According to Size and Ownership (in %; Rasmussen, 1997)

	Size of Firm[a]					Total	
Type of firm	<10	10–49	50–199	200–499	>500	%	*N*
Private	65	23	10	2	1	101	4363
Public	6	35	43	12	5	101	141

[a]Number of employees.

security councils, and OHSs published leaflets on WPA. Within this context, a number of firms started workplace activities in order to comply with the first executive order on WPA. These activities presented an opportunity for studies and evaluations on how WPA is being implemented and what the effects of these changes are likely to bring about.

3. RESEARCH ON THE INITIAL DANISH EXPERIENCES WITH WPA

In spring 1999, three studies on the implementation of WPA in firms were completed. The results from these studies are discussed in the remainder of the article.

3.1. Questionnaire on Experiences in OHSs

Rasmussen (1997) conducted in the spring of 1996 a study based on a questionnaire to 9 major OHSs on how the concept of WPA was accepted in firms and the degree of implementation in the firms. The OHSs were all major services covering all regions in Denmark. All services returned the questionnaire. Their reaction is based on a sample of firms shown in Table 1.

To evaluate the degree of implementation, a rating scale used in a Swedish study of the implementation of the Swedish demand for Internal Control was used in the questionnaire. It is shown in Table 2.

TABLE 2. Rating Scale for Judging the Quality of WPA (Rasmussen, 1997)

Rating	Explanation
1	A functioning WPA system, i.e., plan of actions being implemented, most employees are fully informed and involved
2	WPA activities have started, i.e., surveys have been made, there are problems in fixing an order of priority, employees are only partly informed
3	WPA has not started but plans and organization are considered although employees have not been informed
4	No WPA activities at all

TABLE 3. Level of WPA Activity According to Ownership (in %; Rasmussen, 1997)

	Rating of WPA Level				Total	
Type of Firm	1	2	3	4	%	*N*
Private	2	1	1	96	100	4363
Public	17	31	19	33	100	141

The general level of activity reported by the OHSs is shown in Table 3.

Table 3 illustrates how in 1996, 2 years after the legislation was passed, the majority of firms still had not started activities to comply with the new regulatory demands, although it should be noted that firms in the public sector had developed their WPA activities more than firms in the private sector. Furthermore, the level of firm activity was estimated according to size, and the results are shown in Table 4.

The size of the firm (in number of employees) is positively correlated to the level of WPA activity, indicating that while small firms have difficulties in establishing the demanded procedures, larger firms do not.

3.2. Interviews with Persons in Firms Responsible for Working Environment

Within the study initiated by the general union of blue-collar workers and the employers' organization a telephone survey with people responsible for working environment activities in firms was conducted (Toft, Simonsen, Hasle, & Olsen, 1998). The aim was to analyze if the implementation of WPA has developed the activities in firms concerning working environment. The respondents were the people responsible for working environment in 289 firms. One hundred of those firms were randomly selected among firms having ordered the book on 29 recommendations on how to conduct WPA from the national Working Environment Foundation (WEF-sample), while the 189 were randomly selected from the statistics on employment from Statistics Denmark (DK-stat.-sample). The sample is shown in Table 5.

TABLE 4. Level of WPA Activity According to Size (in %; Rasmussen, 1997)

	Rating of WPA Level		Total	
Size of Firm[a]	1–3	4	%	*N*
<10	1	99	100	2837
10–49	10	86	100	1041
>50	30	70	100	626

[a]Number of employees.

TABLE 5. Sample of Firms by Size and Sample (Toft et al., 1998)

	Size of Firm[a]					Total	
Sample	<20	20–49	50–199	>199	no inf.	%	*N*
DK-stat.	29	21	25	24	0	99	189
WEF	4	21	38	30	7	100	100

[a]Number of employees.

In the survey, Toft, Simonsen, Hasle, & Olsen (1998) operated with a measure on where in the WPA process the firms are. In Table 6, this measure is shown in the top of the table. In the upper part of the table, the WPA process is related to the size of the firm. In the lower part, it is related to the type of ownership.

This sample indicates first that 3 years after the law was passed, 40% of the firms have not taken any initiative to comply with the demands. Second, it can be seen that the size of the firm again is positively correlated with the advance in the WPA process. Third, only minor differences between the development in the public and private firms can be found.

In their study, they also tried to get some indications of the effects of WPA. They report that 77% of 198 firms did not "find WPA a superfluous activity." Of the 71 firms having finished one WPA cycle, 74% found "that WPA-activities facilitated problem-solving." In Table 7, an overview of the problems being solved is given.

Many different types of problems are dealt with in the WPA process, and most have found some type of solution. It can be noted that the figures indicate that especially "psychical problems at work" are difficult to deal with. Only in one third of the cases have they found a solution. The respondents were also asked about hindrances to WPA process. Here 38% ($N = 198$) could not identify any hindrances. Approximately one third found that the economical demands for solutions stop the process (especially reported in public firms). Finally, one fourth reported that the time needed for WPA activities acts as

TABLE 6. Distribution of Firms by Size, Ownership, and Status of the WPA Process (in %; Toft et al., 1998)

Sample DK-stat.	Not Started	Planning	Doing	Finished	New WPA	Total	
Total	40	10	29	16	6	101	189
<20	73	7	11	10	0	101	55
20–49	40	10	33	14	4	101	40
50–199	33	10	27	16	14	100	48
>200	5	11	49	25	10	100	46
Private	43	11	27	14	5	100	111
Public	35	7	32	19	6	99	77

TABLE 7. Type of Problems Surveyed and Solved in WPA Activities (Toft et al., 1998)

Type of working environment problem	Surveyed one or more problem $N = 87$	Rate of firms having solved most of the types surveyed
Ergonomic problems	86%	80%
Chemical substances	40%	74%
Noise and vibrations	63%	64%
Layout of facilities and lighting	68%	63%
Psychical problems at work	47%	34%
Indoor climate	70%	57%
Biological agencies	12%	
Accidents	28%	70%

a hindrance (especially reported among the smaller firms). Finally Toft, Simonsen, Hasle, & Olsen asked the group of firms that had conducted the full circle of WPA activities, how WPA was experienced (see Table 8).

As can be seen, those responsible for WPA ascribe a very positive effect to the WPA process in relation to the working environment activities in those firms that have completed the first set of WPA activities.

3.3. Questionnaire on Status in State Institutions

To get an idea of the progress of WPA in state institutions, a questionnaire was sent to approximately one third of all state institutions at the end of 1997 (Finansministeriet, 1998). Three hundred twenty-two institutions (85%) returned the questionnaire, and results for 1997 are given in Table 9.

TABLE 8. Effect of WPA (Toft et al., 1998)

	Importance		
Possible experiences ($N = 85$)	big	minor	non
More problems are solved	58	21	21
More people participating in working environment activities	59	22	19
The employees affected become more involved	65	21	14
The managers affected become more involved	58	23	19
The safety organization has gained strength	58	21	21
The working environment activities have pointed more forward	65	28	7
A faster change in conduct	37	32	31
Many small problems are being solved	54	19	27
The more severe problems are taken up	68	13	19

TABLE 9. Status of WPA Activities for 1997 in Danish State Institutions (Finansministeriet, 1998)

Status	No initiative	Planned but not scheduled	Plans ready	Have started	Have finished
Institutions (%)	35	11	4	34	16

The distribution of activities given in the former study is confirmed in this study. The institutions that had not taken any initiatives were asked why. The distribution of responses is shown in Table 10.

This should be seen in combination with the fact that almost 70% of the institutions that had made no initiative had less than 25 employees. In addition, these institutions were asked to identify barriers to the WPA process (see Table 11).

Finally, the respondents who had been active with WPA activities were asked to tell in their own words what were the main effects of WPA (see Table 12).

3.4. Tentative Conclusions

The three quantitative surveys convey similar results on WPA, namely:

1. It is mainly bigger firms that are able to comply with the demands.
2. Public firms have a higher degree of compliance.
3. Processes based on joint action are considered important.
4. Time and economy are the major hindrances—especially in the public sector.
5. Respondents in firms engaged in WPA found it gave a higher quality to the working environment activities in the mandatory safety organization.

Also, the results of these studies indicate how WPA can be used as a change initiative for vitalizing working environment activities and removing the safety organization from its previous side-car position. Moreover, it could be argued that WPA could be the first step in a development of occupational health and safety management systems in the more motivated, primarily larger firms. In order to investigate this notion further, the results of a study based on qualitative data are presented below.

4. QUALITATIVE DATA ON EXPERIENCES IN FIRMS

Several larger firms and several OHSs arranged seminars to evaluate their first experiences with WPA. In being invited to participate as a facilitator in approximately 10 sem-

TABLE 10. Causes for No Initiatives (Finansministeriet, 1998)

Cause for no initiative	Lack of knowledge	Uncertainty around WPA	Awaiting other stakeholders	Postponed due to programs	Others
Institutions (%)	34	12	35	2	18

TABLE 11. Barriers to the WPA Process (Finansministeriet, 1998)

Barriers to the WPA Process	Institutions (%)
Lack of time	40
Economic resources	36
Lack of participation of employees	30
Too ambitious plans in the safety organization	10
Low response to questionnaires	7

inars, the author had the opportunity to gather data in a semistructured way. The typical participants at these seminars were the members of the safety organization, although some of the working environment experts from the affiliated OHS were also present. The seminars were arranged by the safety organization (i.e., the safety manager) or by the affiliated OHS.

With the assistance of a student at the Technical University of Denmark, these data have been supplemented with interviews with two safety managers from the University of Copenhagen and a major Danish chain of cooperative stores. In all situations, data were gathered concerning the following issues:

- what tools had been used in the different phases of the WPA process and how were they developed,
- what are the main elements in the WPA process,
- what are the effects of WPA both in relation to the cooperation on working environment and the material results of the process, and
- what are considered the major obstacles to and facilitators of the process.

The "sample" of firms includes the major Danish chain of cooperative stores, 2 out of 14 Danish counties, and the University of Copenhagen. They are all bigger firms with more than 5,000 employees and are organized as independent profit centers employing highly qualified professionals in the fields of general management and working environ-

TABLE 12. Effects and Focus of WPA (Finansministeriet, 1998)

Effect and Area of Focus	Institutions (%)
Good working environment	79
Visibility of the safety organization	52
Priority to investments	13
Design of working sites	11
Higher effectivity in production	10

ment. The OHSs involved in the study had a broad contact with smaller firms typical of the Danish industrial structure.

As shown in the quantitative surveys, the effects of a legislative demand on WPA must be examined along at least two dimensions: first, does it have any effect on the activities in the firm concerning working environment, and second, does it have any effect on the production process giving more safe and sound working conditions.

4.1. The Material Results of the WPA Process

In line with the results from the quantitative studies, typical reported problems concerned: ergonomics, heavy lifting, technical aids, use of chemical substances, and missing knowledge and instruction. The remedies were: new equipment, survey and repair of existing equipment, sanitation and substitution of chemical substances in use, revitalization of existing instructions and procedures, and establishing new procedures and courses and seminars on specific subjects. In most cases, the line organization had taken the responsibility for the problem-solving process, while the safety organization as a staff organization had the role of raising the issue and participating in the process.

At the seminars it was generally acknowledged that the overwhelming majority of problems identified were well-known problems. It was stated that more than 90% of the problems were already recognized by the employees, local managers, and also safety managers and the staff in the OHS. The remedies were also well known for these groups. In summarizing the results of the quantitative studies, it can be argued that in firms responding to the legislative demands, WPA seems to be a promising tool for developing the intended discourse on working environment between management and employees. However, the results of the qualitative study modify this argument, as WPA has not brought new issues on the agenda for the persons most involved. Formalized procedures might nevertheless establish a general overview and update the persons involved on the working conditions in the firm.

4.2. The Process of WPA

Interestingly, the data from the qualitative study support the general picture provided by the questionnaire. It was found that while bigger firms are active in WPA, there are major differences in WPA activities. For example, some departments or shops are in compliance with the law, while others were very difficult to motivate to get started. The findings also indicate that the tools presented, especially in the guidance from the Labour Inspectorate but also from other organizations, have been useful in promoting the development of tools in the WPA process. However, all stressed the importance of establishing a system (typically in the form of one or more checklists) tailored to meet their own needs. In all cases these tools have been developed by a taskforce having representatives from the safety organization and expertise within working environment (i.e., safety managers or OHS personnel). Although the processes established were not identical, the general steps shown in Table 13 can be found in all approaches to implementing a WPA process.

This presentation of problem-solving activities corresponds to the presentation in the pamphlets distributed by the Labour Inspectorate and other agencies promoting WPA. It is found also in elementary textbooks on problem solving in engineering and business management. So, the presentation can be said to be well known and generally accepted. It differs from the typical description of the former problem-solving activities concerning

TABLE 13. Typical Steps in the First WPA Process

Step	Description of the Phase
1	*Information on WPA* describing intentions and expectations, methods to be used, and timeplan.
2	*Collecting information on working environment problems*, which has been done in different ways.
3	*Remedy of problems easily solved*, where "easily" refers to problems in which the solution is evident and within the economic framework of the local manager.
4	*Give priority to the remaining problems and establish a tentative local plan of action.*
5	*Obtain approval* of the local plan of action. The approval is manifested in a grant, and the procedure leading to the grant is comparable to normal budgeting procedures in the firm. The expenses for the local plans having to be approved typically exceeds DKr 50–100,000 (US$ 10–15,000).
6	*Implement the plan locally.*

working environment. Single cases were brought up in which apparently no overview was established, the local relevance and importance of the problem were not made obvious, and sometimes the dominating impression was that the safety representatives were making a mess of things. This indicates that the implementation of WPA has formalized working environment activities. This has been emphasized as an important benefit of WPA at all meetings and in all interviews, and corresponds to some of the benefits listed in the surveys.

Through the discussion and interviews, factors facilitating a successful WPA process have been uncovered. Here the picture from the surveys is generally confirmed. First, external pressure is clearly promoting the process. The major agency for establishing this pressure is the Labour Inspectorate. But also consultations from the OHSs calling attention to the demand for WPA can initiate WPA activities. Second, and not surprisingly, senior management priority to WPA is of major importance. Most of the firms covered have explicitly stressed that human factor issues are a part of the first-line managers' job, implying that the problems should be dealt with in the line organization, and not primarily in the staff organization (the safety organization). Third, it is advantageous to give authority to a person (typically the safety manager or a competent safety representative) or an organizational unit (typically the OHS) to act as an information and resource center and as "a whip" toward more hesitating first-line managers and reluctant safety representatives. Fourth, qualifications (knowledge, skills, and experiences) in handling working environment issues are a major prerequisite for promoting WPA. A basic knowledge by first-line managers has in most cases been central. It is not a thorough knowledge on exposures and reactions that is needed, but much more a general understanding of the demands in the law, expectations from top management, and how to establish a feasible process.

4.3. Different Interpretations of the Process

As already stated, WPA represents a conceptually new approach for handling working environment problems. Managers stressed that these types of problems now appear much

more formalized than previously. This new initiative has engaged them positively, and as a result, the avowed intention formulated in working environment policies is now followed by actions in the budgeting procedures. From this it might be concluded that the primary effect of WPA is to present working environment problems in an acceptable form that corresponds to dominant management ideology on how to establish a basis for decision making. This interpretation thus emphasizes WPA as an imitation of the dominant representation of activities and thereby rests on the legitimacy of rational decision making (DiMaggio & Powell, 1991).

In examining the data, there are indications that other interpretations of WPA are also of relevance. At some of the seminars both safety managers and employees in OHSs pointed to a new tone of cooperation. Formerly, low levels of activity have characterized cooperation. Issues were not systematically analyzed, and safety representatives often expected management to settle the claims that safety representatives brought forward. Now a new joint problem-solving process has been established. Both safety representatives and local managers are involved in establishing a survey of the working environment in their department, and the information gathered through checklists and the like delivers "user-points of view" on the working conditions. Furthermore, a joint discussion of priorities and possible actions to be taken inevitably has to be established. In this sense, WPA has supplemented the legitimate boundaries for a working environment discourse originally established by the law with an approach that is accepted by all parties. This interpretation emphasizes WPA as a facilitator for rational procedures concerning working environment corresponding to approaches presented in dominating textbooks in the field (Olsen, 1998).

However, as already noted, this has not been the only effect of WPA. The introduction of WPA has in many of the firms been combined with educational efforts, many of which have focused on the first-line manager. In such cases, first-line managers have been instructed in the intentions behind WPA, the expectations not only from legislators but also from their top management concerning problems to be handled (not only safety problems but also health problems) and procedures to be followed. This interpretation emphasizes WPA as an occasion for opening new interpretive schemes for middle and top managers' understanding of their job. Moreover, local management and safety managers report that the WPA approach also requires new qualifications from safety representatives and many first-line managers. They have to develop analytical abilities so they can separate cause and effects, identify interacting causes, and understand the different principles of prevention that can be implemented. Courses are not sufficient for acquiring these qualifications, rather it is through engaging in specific activities that these qualifications are developed. This implies that the local managers, safety managers, and other working environment staff (e.g., from the OHSs) need to be aware of the educational aspects of their contact with first-line managers and safety representatives. This interpretation of WPA can be seen as a strengthening of the power base of the major actors (safety representatives and foremen) who are now central in the legally established "platform for a working environment discourse."

5. DISCUSSION

The result of the analysis of the qualitative data modifies the optimistic picture ascribed to the analysis of the quantitative data. It demonstrates that if a firm is willing to accept the legislative demand for WPA, it may cause a vitalization of working environment ac-

tivities. Two challenges have to be met: first, hindrances have to be removed, and second, approaches have to be adapted to smaller firms. The hindrances may be removed by presenting the positive experiences gained in many different types of enterprises, concerning tools, process, demand for resources, and outcomes. An appropriate approach for smaller firms may prove more difficult, but presently, OHSs are involved in experiments partly financed by public funding.

In comparing the findings with legislative demands, a congruence can be established among the five steps presented in Table 13 and the first three out of four elements stated in the law. However, it should be noted that the fourth element, "instructions for follow up," has not, up until now, been given much attention. Therefore it is presently an open question as to whether WPA processes will become normal procedures for dealing with working environment. It might simply be a "one time shot," inspired by the rather extensive campaign and used by the working environment professionals as a platform for drawing attention to their issues.

With regards to the more "successful" cases, the results can typically describe a type of repair activity to existing working sites, rather than an effort to develop the design of workplaces and the planning of work activities in the firm. In the less successful cases, WPA would appear to simply produce extra paperwork. The focus is on documenting a survey of working environment problems typically based on more checklists.

So, how do the results from these studies compare with the formulation in the law? In the first executive order it was stated that management had an obligation to assure an assessment of risks when planning and organizing work. However, even in the successful cases only a weak tendency can be found toward using the results from WPA as a guideline for job design. The seminar discussions demonstrated that the safety organizations base their solutions to problems on one or two strategies: either the safety organization undertakes the development and implementation of the solution or it tries to motivate the first-line manager to engage in problem solving. Explicit strategies to influence the designers of equipment, workplaces, and jobs were found in only a few cases, even though the designers could be identified within the firm. In other words, one of the central elements in a preventive approach has not been affected by the demand for WPA.

Second, the results highlight important characteristics of the local understanding of working environment problems. To analyze this aspect of WPA the concept "local theory of the working environment" can be used. This approach is inspired by Elden and Levin (1991) and Sørensen and Sætnan (1983). A "local theory" is the common, explicit understanding in a group of a specific issue, in this case working environment. An action-oriented local theory must develop a mutual, maybe fragmentary, understanding within four themes: (1) a common agreement of what is considered a present work-related problem, (2) a shared understanding of a web of causes behind the problem, (3) an agreement of the legitimate base for action, and (4) ideas of possible actions to remedy the situation and elements in a plan for action. The WPA process can be interpreted as a formalized process to negotiate, elucidate, and develop the local theory of working environment of the actors involved. Nevertheless, although the law makes it legal to discuss social-psychological problems (such as, workload stress and relationship problems) the debates on the seminars explicitly demonstrated that employees and their representatives seldom find it legitimate to raise them in WPA activities. Multiple reasons for this can be identified with reference to the concept of local theory. For example, some groups question the legitimacy of dealing with these problems in joint problem-solving committees. They feel it should be handled individually, eventually with direct contact between the person

having the problem and the first-line manager. Typically, psychosocial problems have not yet gained the same legitimation within the safety organization as physical working environment problems. Moreover, many groups find it difficult to handle the problems. They lack a shared, legitimate vocabulary for considering such problems. Differences among the "exposed" in reactions and coping strategies make it difficult to establish a general strategy of action, and remedies that might benefit the situation for some are considered a threat to others.

The findings from the surveys and qualitative studies show that although WPA has vitalized the working environment discourse on the "scene" established through the law, actors are presently performing within narrow mental and organizational boundaries, which delimit their activities to particular problems and specific organizational procedures. Typically, the WPA process becomes an organizational routine for the repair of the design of workplaces emphasizing well-known problems concerning the physical working environment. Even though the routines correspond to the dominating ideology of how to manage, the success in larger firms and the potential in others are questioned by the results of the qualitative study.

Only a few examples have been reported where WPA provides an opportunity to reflect on how decisions in design and in general management have been formerly taken, and how they ought to be taken in the future. So, up until now, only a few examples were available on WPA as a tool for bridging the gap between general decision making in the firm and decisions concerning working environment.

6. CONCLUSION

How to assess the Danish experience of implementing WPA remains an open question. If immediate compliance with law is expected by all persons and firms affected, only a 60% "score" on the most basic indicator of compliance could be recorded. On a more pragmatic level, it is to be expected that companies will not be able to immediately comply with the law and that smaller firms are likely to have particular difficulties in complying with legislation. The legislative demands have to be acquired and appropriated by central actors in the enterprises (i.e., the members of the safety organization), and this takes time. However, with reference to the results of the quantitative studies, the Danish experience with WPA can be characterized as a "success." Many circumstances were favorable: the social partners generally agreed on the basic approach to WPA; the qualified staff in the OHSs were prepared for, interested in, and able to support this strategy; and in larger firms, several people took up and responded positively to the strategy.

Nevertheless, even from a pragmatic point of view, the success of the strategy can be questioned. Not only was it primarily larger firms that reacted positively to the legislative demand, the change initiatives centered on repair activities and generally were not linked to fundamental preventive actions. Time will *show* whether there will be a change in the dominant (physically oriented) understanding of working environment problems and an opening in organizational procedures for broader issues presently excluded from the working environment discourse. These early findings, especially from the qualitative study, question the viability of WPA as a measure for establishing continuous improvement of working conditions. For further developments, external pressure from the Labour Inspectorate needs to be maintained, and other key actors such as safety managers and OHSs need to be actively involved in facilitating change.

Presently, the evaluation of WPA as a regulatory instrument in Denmark remains ambiguous. Regarding larger firms, it is possible to argue for a certain success. However, to meet the basic demands of the law, the aspiration of working environment professionals, and the ideal request from most employees, a general development of the WPA activities must proceed. The coming years will show whether the network established by the social partners, the labor inspectors, and the OHSs will be able to promote and support this development in all Danish firms. The development will not proceed automatically.

REFERENCES

AMF. (1995). Idékatalog med metoder og redskaber til at gennemføre arbejdspladsvurdering. København: Arbejdsmiljøfondet.

Aminoff, S., & Lindstöm, K.G. (1981). Effektivare former för skyddsarbetets organisation. Garpenberg, Sweden: Skogshögskolan.

Clark, T.S., & Corlett, E.N. (1984). The ergonomics of workspaces and machines: A design manual. London: Taylor & Francis.

Clausen, C., & Lorentzen, B. (1986). Deltagelse i beslutninger om ny teknologi. Tåstrup, Denmark: Teknologisk Instituts Forlag.

Clinch, J.P., Convery, F., Fitzgerald, E., & Rooney, S.M. (1998). Economic instruments for sustainable development: Improving the external and working environments. Dublin, Ireland: The European Foundation for the Improvement of Living and Working Conditions.

DiMaggio, P.J., & Powell, W.W. (1991). The iron cage revisited: Institutional isomorphism a collective rationality in organizational fields. In W.W. Powel & P.J. DiMaggio, The new institutionalism in organizational analysis (pp. 41–62). Chicago: University of Chicago Press.

Direktoratet for Arbejdstilsynet. (1993). Bekendtgørelse om arbejdets udførelse. København: The Danish Labour Inspectorate.

Direktoratet for Arbejdstilsynet. (1999). Statistics on accidents and occupational diseases (www.arbejdstilsynet.dk under "Arbejdsmiljø i tal"; UK: working environment in numbers). København: The Danish Labour Inspectorate.

EEC. (1989). Directive on the introduction of measures to encourage improvements in the safety and health of workers at work. (Directive 89/391).

Elden, M., & Levin, M. (1991). Cogenerative learning—Bringing participation into action research. In W.F. Whyte (Ed.), Participatory action research (pp. 127–142). Newbury Park, CA: Sage.

Finansministeriet. (1998). Status på arbejdet med gennemførelse af arbejdspladsvurdering i de statslige institutioner. København: Notat, Finansministeriet og CFU.

Grandjean, E., & Kroemer, K.H.E. (1997). Fitting the task to the man: A textbook of occupational ergonomics, 5th ed. (Original work published by E. Grandjean, 1963)

Gunningham, N., & Johnstone, R. (1998, September). The legal construction of OHS management systems. Paper presented at the conference on Policies for Occupational Health and Safety Management Systems and Workplace Change. Amsterdam, The Netherlands.

Høy, J., & Jensen, P.L. (1996, April). Union activities to promote cooperative activities at enterprise level: Workplace Assessment. Proceedings from the XIV Congreso Munidal Sobre Salud y Seguridad en el Trabajo, Madrid, Spain (pp. 617–618).

Jensen, P.L. (1995a). From talk to action: Management and health, wellbeing and safety activities. Paper presented to Workshop on Understanding the Work Environment, Stockholm.

Jensen, P.L. (1995b). Viden om arbejdspladsvurdering—et arbejdshæfte fra FTF. København: Funktionærernes og Tjenestemændenes Fællesråd.

Kiil, O., & Heide, J. (1986). Arbejdsmiljø og Teknisk planlægning. København: Arbejdsmiljøfonden.

Møller, N., Jensen, P.L., & Jensen, O.B. (1987). Arbejdsmåder i Sikkerhedsgruppen. København: Arbejdsmiljøfonden.

Murrell, K.F.H. (1965). Ergonomics. Man in his working environment. London: Chapman and Hall.

Olsen, E. (1998). Risikovurdering i arbejdsmiljøet. København: Arbejdsmiljøinstituttet.

Rasmussen, B.H. (1997). Arbejdsmiljøstyring i Norden og kvalifikationer til arbejdspladsvurderinger. TemaNord 1997:616, Nordic Council of Ministers, Copenhagen.

Sørensen, K.H., & Sætnan, A.R. (1983). Makt og medvirkning i arbeidsmiljøet. Trondheim, Norway: Norsk Institutt for sykehusforskning.

Toft, E., Simonsen, J.R., Hasle, P., & Olsen, P.B. (1998). Arbejdspladsvurdering—hvordan og hvor langt? Copenhagen: Center for Alternativ Samfundsanalyse (CASA) and Roskilde University (RUC).

Zwetsloot, G.I.J.M. (1998, September). Reviewing the debate on occupational health and safety management system standardization. Paper presented at the conference on Policies for Occupational Health and Safety Management Systems and Workplace Change. Amsterdam, The Netherlands.