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NEWSLETTER

Asbestos ban in Europe: Final page turned in an epic tale?

Dangerous substances: Commission to review European legislation

SPECIAL REPORT

Musculoskeletal disorders in Europe

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editorial

The Community is changing,

All may seem to have gone quiet on the Community health and safety front as a new treaty is brought in and a new Commission takes up the reins. But that should not mask the very real on-going issues, or the advances made through trade union efforts.

Paramount among these are the future consultation procedures on Commission initiatives. In future, it will have to take account of the legislative expertise and experience of the tripartite bodies, and the new Treaty procedures handing important new responsibilities to the social partners. But this procedural issue must not obscure the substantive issues, bearing in mind the demands of the ETUC's 9th Congress (Helsinki, June 99) for the EU to bring in measures against new work-related risks and to secure full transposition and implementation of directives. The ETUC Congress also stressed the failings of existing rules and lack of enforcement against a background of growing casualisation.

On the legislative side, the German Presidency dusted off the Commission's 1993 proposal for a physical agents directive. But, backed by virtually all the Council members, it proceeded to pull the proposal's teeth by limiting its scope to exposure to vibrations and dropping any mention of health exposure limits. The June Council's ostensible reason for this was the lack of scientific knowledge in the other areas like noise and electromagnetic fields. Surely some mistake, given its own Noise Directive adopted in 1986 (Directive 86/188/EEC) which should have been reexamined and adapted to scientific and technological progress by 1 January 1994. Furthermore, the "Health" Council of 8 June 1999 approved the principle of a Recommendation on electromagnetic fields referring to the 1998 ICNIRP (International Commission on Non-Ionizing Radiation Protection) Recommendations. Work on the proposal for a vibrations directive will go forward under the Finnish Presidency.
A directive to protect workers from physical agent hazards

the issues are the same

remains paramount given the size of the workforce exposed and their health effects. The discussions on the vibrations directive raise urgent questions about accounting for the varied health effects of vibrations, especially on muscles and joints.

Musculoskeletal disorders are the main cause of work-related illness today. The ETUC's call for European action is starting to filter through. The special report on national practices, based on a survey of trade unions, included in this double issue of the TUTB Newsletter shows the problems faced by workers in proving the work-relatedness of their health problems. Articles by scientific and technical experts also report on the current consensus opinions on the issue. As we go to press, the European Agency in Bilbao is announcing its next round of work on the topic and a European week on the issue in the year 2000.

There has also been a result on a related issue. The Commission's decision to ban the placing on the market and use of all asbestos fibres EU-wide brings long-awaited cheer to all those who have been fighting to outlaw a product which is still and will go on killing mainly workers, given the volume of asbestos already in place that will have to be stripped out. A WTO ruling on a Canadian complaint against a French asbestos ban is imminent within months. It will be a clear-cut test of what importance the WTO intends giving to health risks - asbestos is a carcinogen and the risks are established beyond doubt - and especially its ability to "stick to its knitting" - it holds no remit for safety and health protection!

Marc Sapir,
TUTB Director

IN THIS ISSUE

Asbestos ban: towards a European consensus (IV)

Final page turned in an epic tale?

On 4 May 1999, the EC's DG III (Industry) put its final proposal for banning the remaining asbestos fibre applications in Europe[1] to the Technical Progress Committee (TPC), where it was adopted by a qualified majority. The ban will be established as a Commission Directive, adapting to technical progress for the sixth time Annex I to Council Directive 76/769/EEC[2] restricting the marketing and use of dangerous substances and preparations within the European Union.

Up to December last year, the proposal was the focus of a fairly intensive discussion relaunched in 1997 between representatives of Member States, Industry, the Trade Unions and the Commission itself. At that time, the Commission's hope was that after 20 years of EU asbestos legislation, Member States might be able to reach a qualified majority decision to ban it.

The draft proposal presented and discussed last December[3] imposed an all-out ban on all asbestos fibres with a five-year transitional period and a ten-year derogation for one specific chrysotile asbestos application (diaphragms for existing electrolysis installations).

Other than some minor changes due to the Amsterdam Treaty, the key change in the proposal put to Member State representatives last May was the deadline for ending the derogation on electrolysis diaphragms. This was dropped in the face of German government protests that it would spell closure for those installations still using such diaphragms. This, Germany said, would also threaten many other workplaces in dependent and/or linked industries[4].

Decision finally taken after a bumpy ride

There were real fears that a qualified majority might not be achieved[5] because Germany's votes were far from sure, while three other Member States (Spain, Portugal and Greece) had already come out in favour of keeping the status quo.

As a consequence, Spain, Portugal and Greece would be able to continue with the marketing and use of their asbestos products[6] where some 2400 jobs are directly at risk[7] as against - according to our information - the fewer than 60 people apparently employed in the German plants concerned.

Even more significant, however, are the larger numbers of workers who may be affected through these production chains, now and especially in the future (if the experience of other fibres is anything to go by).

Further postponing the adoption of the Directive could also have been used by Canada in its WTO complaint against France for banning the use of chrysotile. If the ruling in the proceedings to re-open the French market for the import of chrysotile-containing products[8] goes against France, all other European countries where asbestos has been outlawed for several years might find themselves also forced to re-open their own markets.

Those are some of the reasons why the proposal finally did get its qualified majority in the Technical Progress Committee. A formal announcement in the Official Journal was expected for mid-June[9] which, in turn, would have brought the Directive into force 20 days later. But nothing happened until the end of July. It was rumoured that after the meeting Greece said it intended challenging the TPC's decision on the grounds that the Commission lost the right to take policy decisions with its mass resignation in April 1999, and now had only administrative powers.

Another more persistent rumour was that one of the Commissioners blocked the passage of the Directive in the normal written procedure to become EU law[10] by not signing it. However, the Commission finally succeeded in adopting the directive on 26 July, just ahead of the summer recess (Directive 1999/77/EC)[11].

The key question, then, remains what else must be done, especially from the union view, to protect workers still exposed to asbestos (see inset). But other issues, like what to do

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[1] See previous articles: Asbestos ban: towards a European consensus (I), *Newsletter* n° 7, December 1997, pp. 2-4; (II), *Newsletter*, n° 9, June 1998, pp. 15-17; (III). Asbestos-free Europe next stop?, *Newsletter* n° 10, December 1998, pp. 2-3; Asbestos ban in France: too late for many, *Newsletter* n° 4, November 1996, pp. 2-5.

[2] Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (asbestos).

[3] See Asbestos ban: towards a European consensus (III). Asbestos-free Europe next stop?, *Newsletter* n° 10, December 1998, pp. 2-3.

[4] The other changes in the new proposal are more or less the result of that deadline being dropped.

[5] The Commission needed 62 of the 87 votes to get a qualified majority – i.e., fewer than 25 votes against a proposal. Greece, Portugal and Spain together have 18 votes, which with Germany's 10, could have defeated the proposal.

[6] in particular asbestos cement products e.g. pipes, roofing and wall cladding.

[7] according to a study commissioned by the Commission on the social and economic impacts of an asbestos ban.

[8] The real reason for Canada's action is not the loss of a market in Europe but the possible domino effect on particular Third World or less-developed countries.

[9] Because it will take the form of a Commission Directive adopted under the adaptation to technical progress procedure, no further consultation of the Council or European Parliament is necessary.

[10] There are two possibilities:

1) The written procedure is circulated and all the Commissioners sign it. A date (deadline) is set and if no objections are made by that date, it is deemed to be passed by default.

2) The written procedure is put on the agenda for the Commission's weekly Wednesday meeting; it is debated and can be passed by a simple majority of Commissioners (11 votes are needed).

[11] OJ L 207 of 6 August 1999, p. 18. This article was written before the directive was adopted. The reference was included in final revision.

about asbestos-containing waste, are also clamouring for answers.

The ban, if brought in, will have no immediate results, especially for exposed workers in the maintenance, refurbishment, demolition and removal sectors.

The ETUC resolution on the protection of workers exposed to asbestos

In October 1998, the ETUC gave its full backing to the Social Affairs Council's resolution for a root-and-branch review of existing legislation to protect workers against asbestos and its call for the Commission to allocate the necessary financial and human resources.

The ETUC resolution also stressed the need to lower existing exposure limit values for all asbestos fibres at least to the lowest level already achieved in the Member States, and for European regulations to ensure professional skills for removal, demolition and maintenance.

The ETUC also called for a register of the incidence of mesotheliomas and cancers to be kept in each Member State, and for the Commission to consider the scope for harmonising existing national rules on registration of asbestos in building, plants, infrastructure, transport equipment, household equipment etc., and intervention on sites.

The ETUC's demands are in line with the Economic and Social Committee Opinion of 11 March 1999[12]. The question remains, how can the Commission, and DG V in particular, be urged along that road?

DGV action to date

As the Directorate General responsible for health and safety protection of workers at work, DGV held a first round of consultations with Member States last September to review existing legislation on the protection of workers exposed to asbestos. A second meeting in March this year was due to be followed by a final meeting in June. All these meetings are regarded as groundwork prior to canvassing the social partners' views.

Our information is that Council Directive 83/477/EEC (as amended by Directive 91/382/EEC) will be further amended, taking into account the demands of the Council Conclusions of 7 April 1999 and the Europe-wide ban on asbestos. The amendment should also provide for a review of existing exposure limit values. A European register of asbestos-containing buildings is thought to be too complicated.

The question remains why some Member States can do this and others cannot. The ETUC / TUTB should take it upon themselves to collect all the information available in different Member States on provisions and legislation dealing with the issues we as trade unions would like to see improved Europe-wide. The new ad hoc group of the Advisory Committee for Safety, Hygiene and Health at Work on Asbestos set up at last May's Advisory Committee plenary seems an apt forum for action.

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Protection of workers exposed to asbestos in the EU

Protection of workers against asbestos exposure is - so far - regulated at Community level by:

- Council Directive 83/477/EEC (as amended by Directive 91/382/EEC) on the protection of workers from the risks related to exposure to asbestos at work; and
- Council Directive 90/394/EEC (as amended by Council Directive 97/42/EC) on the protection of workers from the risks related to exposure to carcinogens at work. A proposal for a second modification of Directive 90/394/EEC has recently been adopted by the Commission.

Whereas Council Directive 83/477/EEC set requirements for a risk assessment, exposure limit values (currently 0.6 fibres per cm^3 for chrysotile), personal protective equipment, and medical surveillance, among other things, Council Directive 90/394/EEC also provides a wider framework for controlling workplace activities where workers might be exposed to carcinogens, including asbestos.

One key provision of Directive 90/394/EEC which employers must bear in mind is the principle that when technically possible, a carcinogen must be replaced with a substance, which is not dangerous or less dangerous to health.

Directive 83/477/EEC takes precedence over Directive 90/394/EEC where it provides more stringent measures than those laid down in the latter Directive.

[12] Opinion of the Section for Employment, Social Affairs and Citizenship on Asbestos, SOC/004 (Ex. SOC/340), Brussels, 11 March 1999.

Overhauling the Machinery Directive

The thrust of the present Directive: the New Approach

Directive 89/392/EEC adopted by the European Council in 1989 under article 100A of the then Treaty (now article 95 of the Amsterdam Treaty) set the conditions in which machinery is allowed to move - and be placed on the market - freely in Europe. What it did was to set design requirements which manufacturers must satisfy to protect users' health and safety, means of proving that equipment complies with those requirements, and a set of rules which Member States must follow to stop dangerous equipment from being placed on, or order it to be withdrawn from, the market.

The Commission has given CEN and CENELEC - the European standards bodies - mandates under this Directive as amended to frame harmonized technical standards. These are voluntary guidelines, but if complied with, they confer on manufacturers or their representatives a presumption of conformity with the health and safety requirements set by the Directive. Apart from the special machinery listed in an annex, manufacturers of almost any type of machinery can certify that their products conform to the essential requirements without having them certified by a third party.

This Directive is a lever of public intervention in equipment engineering design, an area often regarded as the sovereign preserve of business and design engineers. It is commonly argued that government should have no say in technical choices. The trade union movement, as the voice of work equipment users, believes that protection of workers - and by extension, final users - cannot be left to the mercies of the market alone. Public intervention in this area is essential. The debates around the adoption of Directives at different stages of the Community legislative procedure are vital forums for users/workers to demand that protection from physical and psychological harm should be designed into equipment. The debate is also moved on through the interpretation and filling out of the essential health and safety requirements by the European standards institutions under mandates from the public authorities.

Hence the TUTB's involvement in technical standardization work. But under-resourcing means that the working groups which draft the standards tend to comprise only experts and manufacturers. The main effect of this imbalance is to sideline the specific, detailed knowledge of users and prevention practitioners, or take it into account only through manufacturers or inspection bodies (notified bodies under the New Approach Directives), i.e., where their economic interests are taken into account.

Technical standards

To date, the Commission has mandated 727 standards under the Machinery Directive; 364 of them have already been adopted by CEN's national members and 99 are being prepared. The other standards are going through procedures. When the Directive was passed, it made no provision for controlling whether standards complied with the essential requirements; it was an entirely self-policing system. Pressure from the Member States led the Commission to ask CEN to appoint specialized consultants to audit the draft standards for compliance with the essential requirements. Some Member States have challenged specific standards or draft standards for certain types of machinery[1].

The manufacturers' liaison group, Orgalime, has repeatedly called for work to be speeded up and strict time limits set on the European standards institutions. But this has been parried by those who want standardization to reflect a real consensus between the parties involved, especially for guidelines which the public authorities invest with a presumption of conformity with the law!

Directive under attack

The Directive has been in force since 1 January 1993. Allowing for the transitional periods, it has been fully applicable to all types of machinery since 1995. Passed in response to industry demands as a good way of underwriting

[1] See France invokes safeguard clause against a European standard, *Newsletter* N° 5, February 1997, pp. 13-16; The United Kingdom's safeguard clause on EN 708 - Agricultural machinery, *Newsletter* N° 10, December 1998, pp. 6-7.

the free market, the Directive has since been attacked by industry over its scope, its overlap with other Directives, and the paperwork it entails. Since the Molitor Group's report (published in 1995) called for the definition of "machinery" to be clarified, for the market in used machinery to be protected, for simpler manufacturer's risk assessments, and generally speaking, cuts in the cost of compliance[2], industry has been consistently calling for the Directive to be trimmed back. Replying to the Molitor report, the Commission announced proposals for a complete overhaul of the Directive for the end of 1997.

The context of the revision

The revised draft was prepared in the Machinery Committee set up by the Directive and chaired by the Commission. All Member States are represented in it, and industry, the TUTB, the coordination body of notified bodies and CEN machinery consultants are invited to attend its meetings. A series of versions were discussed, and the tripartite Luxembourg Advisory Committee was consulted on the most recent (ref. EN-III/4101/97 rev.3). At the start of 1999, the Commission asked the different delegations to send in their formal views on the document. The TUTB responded with a number of remarks and detailed comments. The Commission representative said the Commissioners would adopt a proposal before year-end. However, the mass resignation of the Commission could upset that timetable.

The contents of and debate around the draft must be seen not just in the light of the Molitor Group proposals, but also the safeguard clauses invoked by some Member States, and especially the questions put to the Commission by different national delegations and industry about the interpretation of the Directive. Since being set up, the Machinery Committee has already discussed and answered around 150 questions. But these consensus views have not been published at Community level and have no legal authority. The individual Member States have ultimate responsibility for implementing the Directive, so the replies can never be more than guidance. Only a Commission proposal to the Council following the procedure laid down in the Treaty can give the replies official force.

Changes in the markets and technologies of machinery and equipment may also colour the approach to the contents of the draft and manufacturers' reactions. So, in the Panorama of European Industry 1997, the chapter on "machinery and equipment", written by Orgalime, calls attention to the fact that machinery manufacture closely mirrors changing technologies, incorporating mechanical engineering, microelectronics, optics and sensor technologies, and new materials. The old-style standalone machine also seems to have lost its central place in the product range, and has now given way to integrated systems with computer technology built-in. But to run these systems, users are increasingly making use of services ancillary to the products. From ten to fifteen percent of machinery manufacturers' sales turnover is now service-related. Another major consideration is the decline of standardized production in Europe and increasing specialization by manufacturers with a large-scale international division of labour in which small firms are key players. Of the 142,000 companies in the sector, 122,000 employ twenty workers or less and their core business is spare parts manufacture and repair. Significantly, the report considers that twenty employees is the bottom limit for the production of complex machinery.

The aim of the revision

Complex machinery

The current focus of debate on the Commission draft is on setting design rules for complex machinery.

Scope

The radically changed scope covers - as it does now - "single" machines, interchangeable equipment, and safety components (set in a list), but excludes assemblies of machines. It includes lifting accessories, mechanical transmission systems, guards for mechanical driveshafts and now for the first time, "quasi-machinery", defined as almost a machine which is incapable itself of performing a specific application but is intended to be incorporated into a machine or assembly of machines. A series of obligations are imposed on manufacturers of "quasi-machinery". In particular, they must draw up a declaration indicating, among other things, the essential safety requirements which the person responsible for the final product must take into account, a reference to the contracts with the customer, and a warning that the product may not be put into service "as is", etc.
Fuller and more detailed definitions are also given of "machinery" and "safety components", which are now listed.

Putting into conformity

[2] See Molitor Group: deregulation assault on health and safety, *Newsletter* n°1, October 95, pp. 2-3.

The procedure for putting machinery into conformity is generally the same as in the existing Directive except for dangerous machinery, where it has finally been recognized that a third party organization must always certify whether it is fully or only partially compliant with the harmonized standards. Manufacturers must now choose between having the technical file and compliance with the harmonized standards verified by the third party, or applying for examination of the file and verification of the conformity of a type of machinery to the technical file.

The essential requirements

The essential requirements listed in annexes to the draft Directive are organized differently, but some aspects have been expanded and filled out, like ergonomics and instructions for users, both aspects which the standards developers have found it hard to flesh out under the existing standardization programme. Clarifying the essential requirements in this way should help the standards body in the planned revision of standards.

The TUTB's view

The draft was the focus of considerable comment, especially from manufacturers and a large number of Member States, but also from the TUTB. In a letter to the relevant Commission departments, we stressed that workers' interests dictated that the Directive should address a series of aims: exhaustive health and safety requirements guaranteeing a high level of protection and taking account of scientific and technological developments. It is also fundamental that products put into service in all Member States should comply with the Directive's requirements.

Because of the failings in interpretation and application, and especially the inbuilt imbalance between the interests represented in standardization working groups which draft specific ('C') standards, we fully support improvements to the existing Directive.

Because of this, we reject the Molitor Group's suggestion that the scope should be limited to ready-to-use machinery, which flies in the face of current technological developments. Also, while admitting the merits of the Commission's desire to set rules for all those involved in product manufacture, and to rope in the growing use of subcontracting, we consider it essential that criminal liability should clearly lie on the person actually responsible for placing on the market, while fully endorsing the obligation on component suppliers and the final assembler to exchange technical information in order to ensure an overall design.

We believe that the concept of "quasi-machine" may muddy the division of responsibilities between the firm which places the product on the market and sells it, and the firms involved all along the line in manufacturing it. The result will be to further tie the public market supervision authorities' hands. The draft as it stands more resembles an attempt to address the industry's development into a network of manufacturers than to meet the challenges it is creating for the national authorities' duty of market supervision. The market in "quasi-machinery" would be unsupervised. Given that market supervision is already too often a non-starter in the Member States, this proposal seems to have its head in the clouds!

The draft requires Member States to exchange information. This is a first step towards working out common rules on market supervision, but appears to be meeting opposition from the Member States, who are focussing on national differences and disregarding their common responsibilities to ensure the conformity of machinery with the Directive's requirements in a "single" market. That shows the need to clarify the responsibility of the final person responsible for supplying machinery to users.

On the overlap with the Low Voltage Directive - a crucial issue given that most machinery is electrically-powered - the differences in treatment and requirements between the two sectors still remain. The essential requirements of the 1973 Low Voltage Directive - a handful of lines - have never been reviewed, despite a rising number of complaints over the years, particularly regarding hand-held equipment. This limitation of the essential requirements effectively gives the standards developers carte blanche in technical choices! The Machinery Directive's essential safety requirements are much more detailed. Not by any stretch of the imagination can the two Directives be regarded as equivalent in terms of requirements. So it must be clearly stated that where a product falls under both Directives, the most stringent requirements must apply.

The views of manufacturers and governments

Orgalime and many Member States' criticisms have focussed on the concept of "quasi-machinery". The manufacturers' liaison group argues that not only will the new obligation increase paperwork, but will also make market supervision impossible. It does not want public interference in the private relations between manufacturers of final products and "quasi-machinery".

But the essential criticism of Orgalime and many other players is that Member States' recognition of the presumption of conformity of all "quasi-machinery", and the differential treatment of manufacturers through the additional constraint placed on the national authorities, put the proposal at odds with the Directive's aims of ensuring free movement and high safety standards.

Two key issues

Our focus is on two issues. Firstly, the role of the social partners in the standardization process. The sentence included after the European Parliament debate in 1989 clearly showed its limitations. It confers democratic legitimacy on the standardization process, but to date, has not guaranteed them an effective influence. A European debate on this obligation is urgently needed, and the future Directive must require the Member States to report at regular intervals to the Commission on what they are doing to give effect to this requirement. Giving users a recognized place in the standards development process could be an area for discussion between designers and users and in some ways be a facet of worker participation in risk assessment: not just identifying, but also controlling, them.

The second issue is the contents of the essential requirements: "technical progress" still remains the benchmark for too many risks. But the concept is not defined, and is left to the manufacturer's, and in some instances to the standards body's, judgement. This is counter to users' interests because manufacturers have no obligation to collect information on users' experiences nor to supply that reference material to the authorities. ■

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The European Commission's DG III updated its two key publications on the Machinery Directive in 1999:

- *Machinery. Useful facts in relation to Directive 98/37/EC,*
European Commission, DG III, Industry,
CO-20-99-866-EN-C,1999;
- *Community legislation on machinery. Comments on Directive 98/37/EC,*
European Commission, DG III, Industry,
CO-01-96-279-EN-C, 1999.

Court of Justice ruling on Italy's carcinogen laws. A result

The long-awaited judgement handed down by the Court of Justice in the IP v Borsana case on 17 December 1998 (see TUTB *Newsletter*, N° 9 and 10) bolsters one of the fundamental principles of article 118A. The provision allows Member States to maintain or introduce rules giving better protection to workers than the minimum requirements laid down by Community Directives. An Italian firm, Italiana Petroli, argued that this power was limited in particular by the proportionality principle and subject to review by the EC Court of Justice. Advocate General Mischo's submissions fell largely in line with the employer's case. The Court's ruling rebuffs this in no uncertain terms, and reasserts that Member States have every right to improve on the minimum provisions of occupational health Directives.

Most importantly, the ruling makes it crystal clear that where governments are exercising their national powers to maintain or introduce tougher laws to protect workers, the Court of Justice has no powers of scrutiny under the proportionality principle (ground 40 of the judgement).

On every other point at issue, the Court of Justice throws out the employers' submissions and Advocate General Mischo's arguments. It also rejects the Commission's half-way position that the Italian rules were in line with Community law on the preventive measures to be taken against carcinogens, but that the proportionality principle might still be invoked to limit Member States' powers. The Court implicitly rejects this approach, and seems clearly to consider that the main yardstick is that national measures must be non-discriminatory and not hinder the exercise of the fundamental freedoms of movement (ground 38 of the judgement).

While the ruling itself can only be welcomed, the lack of interest shown by the Member States is disquieting. Only France sent representation to the hearing to submit observations (which were not on the principles of interpretation of article 118A). Italy's passivity is particularly alarming. Neither of the two Ministers of Labour who held office during the procedure (Mr Treu and Mr Bassolino) made any attempt to uphold the Italian carcinogens legislation. And the proceedings themselves were brought by an Italian public corporation (Italiana Petroli) whose sponsoring department is the Ministry of Industry! ■

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Seminar on the Mobile Construction Sites Directive

The European Federation of Building and Woodworkers called a seminar on 26 and 27 March 1999 to review initial experiences with application of Mobile and Temporary Construction Sites Directive 92/57/EEC. The seminar was for national union health and safety officers, and union activists on European Works Councils in a number of major civil engineering firms. Nearly a dozen countries were represented.

Pierre Lorent (SEFMEP, Belgium) reviewed the state of play on incorporating the Directive in the different EU countries. One key problem appeared to be the lack of detailed rules on who could act as a coordinator. Eligibility requirements as regards initial training, specialized training, continuing training, vetting abilities, etc., vary widely from one country to another. Also, the relation between coordinators and workers' representatives seemed to be an important consideration in improving prevention. What role do trade unions have in training and overseeing authorized coordinators? How are workers consulted on the choice of coordinators and the different stages of their activities?

Relevant tools for assessing the risks involved in simultaneous or successive activities are also a priority. Here, the seminar stressed the value of the risk assessment method worked out in Lisbon in 1996 in the social dialogue between building industry unions and employers.

The TUTB analysed key issues for the trade unions. Among the most significant were:

- the need to ensure that coordination and planning of prevention on construction sites does not focus only on the most visible risks (accidents) but includes workers' demands on other aspects of occupational health (musculoskeletal disorders, stress and mental health, etc.). That requires a trade union policy capable of influencing the work pace, deadlines, use of subcontractors, etc.;
- one of the Directive's biggest fault lines relates to employee representatives. The different levels of representation must be interconnected and tasks allocated between them. This would include the European Works Councils of large civil engineering contractors; site committees of workers' representatives from the different firms working on the same site and district reps to cover the vast network of small and medium-sized building contractors. So far, only a handful of countries have this kind of provision. ■

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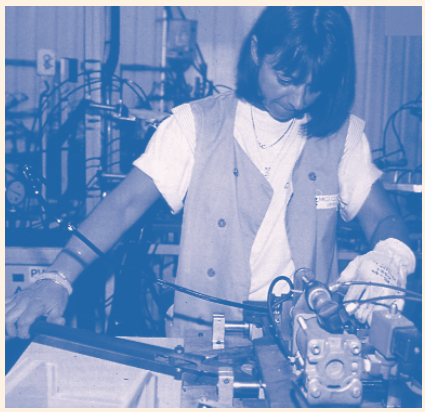
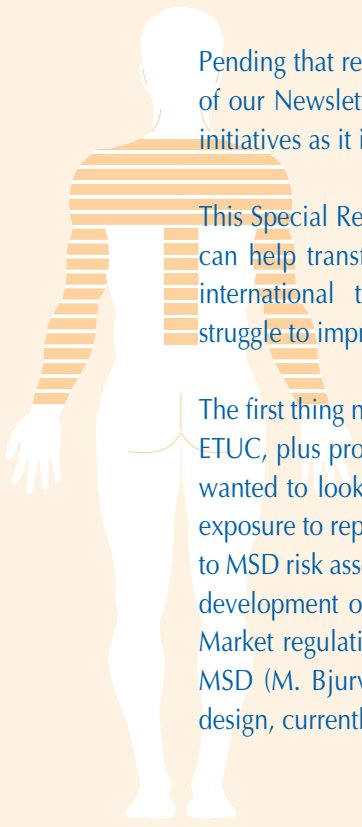
SPECIAL REPORT
Musculoskeletal Disorders in Europe



European workers, still affected in huge numbers by the so-called "traditional" chemical and physical hazards of work, are now facing an effective epidemic of other forms of ailment created by the new forms of work organization. Musculoskeletal disorders (MSD) are a vast mixed bag of illnesses which pose a major health challenge to current and future workers worldwide.

A series of ongoing European debates are enabling some headway to be made in the prevention of MSD. They include the reports that Member States must make on the application of the Manual Handling Directive, the revision of the Machinery Directive, the transposition of the first amendment to the Work Equipment Directive, and the likely fate of the Commission proposal for a Physical Agents Directive. But other factors may have an influence, too. Recent trends suggest that the EU's recent "simplification of legislation" exercise may foreshadow attempts to "simplify" if not roll back past gains.

The European Agency for Safety and Health's much-awaited report (written for the Commission) on "Risk factors for work-related neck and upper limb MSD" should offer a knowledge base with which to stem these trends and offer new ways forward to extend the gains and actions to promote workers' health.



Pending that report being made available for discussion - which it should be by the time this issue of our Newsletter is published - we wanted to give our input to a debate which is vital to future initiatives as it is.

This Special Report, along with Karen Messing's book published by the TUTB on how ergonomics can help transform women's work and Rory O'Neill's forthcoming brochure on European and international trade union initiatives, aim to hand usable tools to all the players engaged in the struggle to improve working conditions.

The first thing needed was an initial stocktaking of recent activities by national trade unions and the ETUC, plus proposals on some of the issues driving the trade union debate (G. A. Tozzi). We also wanted to look in more detail at how an international consensus could be reached on assessing exposure to repetitive movements (E. Occhipinti, D. Colombini), different participatory approaches to MSD risk assessment (J. B. Malchaire, N. A. Cock), and the organizational failings revealed by the development of MSD (F. Daniellou). We have also looked at aspects of employment and Single Market regulations where levers for progress may exist: the recent Swedish legislation to prevent MSD (M. Bjurvald) and the series of CEN technical standards on biomechanics in machinery design, currently in the public inquiry stage (A. Ringelberg). ■

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Musculoskeletal disorders in Europe: unions show a lead

Giulio Andrea Tozzi*

The current upheavals in production technology - and especially organization - are driving working conditions down for a growing number of casualised workers. At the same time, there is an exponential rise in complaints like stress and musculoskeletal disorders (MSD) in all developed countries linked to the way work is managed. These are becoming the main work-related illnesses, signalling a rift between work organization, job design, work load, working time arrangements and workers' capacities.

The growing incidence of work-related MSD points to an effective epidemic in Europe and elsewhere. Current scientific knowledge offers sufficient proof positive of the link between MSD and working conditions, mainly physical but also organizational and social factors, and the fact that effective action on the causes is possible (NIOSH, 1997; National Research Council, 1998).

That is why the European Trade Union Confederation (ETUC) decided to wage an awareness and action campaign on musculoskeletal disorders (see box below). Its member organizations mounted a range of actions in the EU Member States, while the TUTB carried out a survey with help from experts in different countries. This report draws extensively on its findings.

Two questionnaires were sent to trade union experts and various agencies. The first - in 1997 - was to collect information on legislation, available statistics, union activities, the problems and needs for preventive strategies, and the scope for compensation and protection through the courts. The second - in 1998 - aimed more to compile a list of projected union campaigns on MSD for the ETUC Campaign seminars of 17 and 18 March and 5 and 6 May 1998, in Brussels.

Questionnaire N°. 1 - replies received from unions and other organizations: *AK (Austria), CC.OO (Spain), CFDT (France), CGT-FO (France), CFE-CGC (France), CGT-L/LCGB (Luxembourg), DBFT (Denmark), FGA-CFDT (France), FILTA-CISL (Italy), GHBV (Germany), HIOHS (Greece), JGBE (Germany), Kooperationststelle Hamburg (Germany), KOZ SR (Slovak Republic), NGG (Germany), NSZZ Solidarnosc (Poland), Sindnova (Italy), TUC (United Kingdom), USL Poggibonsi (Italy).*

A European awareness-building campaign

The ETUC first flagged up a Europe-wide trade union awareness-building and action campaign on MSD at a Manchester seminar in 1996. A transnational task force to coordinate and discuss campaign preparations was set up in 1997. It planned the campaign as two series of participatory day training sessions and a questionnaire to collect information on national trade union activities on MSD.

The first training session (17-18 March 1998, in Brussels) brought together 18 participants from 17 national organizations in 14 countries and the European Textile Workers Federation. N. Cock opened proceedings by describing the main forms of MSD and ways of preventing them, followed by an analysis of the initial results of the TUTB's questionnaire survey, Owen Tudor's run-down on the TUC campaign, and concluding with Giovanni Cesareo's talk on the essentials of a workplace information campaign. The participants suggested aims, means and resources for new activities and pledged to consult their unions in order to work out practical actions, allocate responsibilities and lay down a timetable of action for the following seminar.

At the second meeting (5-6 May 1998, in Brussels) the participants presented their action programme and the pledges given. They drew up a list of potential areas for negotiating preventive action on MSD, and training needs. They suggested how the campaign could be structured and what tools the ETUC and TUTB needed to set up (brochures, Newsletter, training, etc.). Tasks covering the different aspects of the campaign were also allocated between national trade unions.

The discussions were taken forward in the ETUC's Working Environment Committee in September 1998 and April 1999.

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Questionnaire N°. 2 - replies and documents received from: *ABVV/FGTB (Belgium), BECTU (United Kingdom), CC.OO (Spain); CFDT (France), CGIL-CISL-UIL (Italy), CGT (France), CSC (Belgium), IG Medien, GHK (Germany), LO-S (Sweden), LO-N (Norway), NNF (Denmark), SAK (Finland), TUC (United Kingdom), UGT (Spain), UNISON (United Kingdom).*

Data (not)available

The sources of information on MSD, and on work-related accidents and diseases generally, vary widely in detail, quality and availability. All national unions report dissatisfaction with official information systems, which are neither adequate to describe the range of disorders nor assess their health impacts. Often they reflect only the characteristics and diversity of the compensation systems themselves. The differences between compensation systems and between the lists of legally and medically recognized occupational diseases makes it impossible to get a detailed view of the size of Europe's MSD problem. The recent (1999) Eurostat report (see box below) confirms this view and makes recommendations for improvements.

So we need to go beyond the occupational disease statistics and bring in other sources, like national health systems and subjective, industry sample surveys which can help signpost European and national trends (see box p. 14).

The legislative framework

All EU countries have legislation covering prevention of both general and specific risks; occupational disease legislation covering insurance, compensation and

Making Data comparable

The Eurostat report (A., Karjalainen, S., Virtanen, European Statistics on Occupational Diseases - Evaluation of the 1995 Pilot Data, *Eurostat - Population and Social Conditions 3/1999/E/N°. 2)* comes out of the pilot study (EODS) launched by the Commission in 1991 to achieve comparability of data on recognized occupational disease in the Member States. It analyses the data on a sample of 31 classes of recognized occupational disease recognized in the 15 Member States in 1995 (57,444 cases out of a total 89,735), stressing their limits and how they might be improved:

- More detailed estimates by the Member States of the reference populations for national recognition systems.
- A clearer definition of the inclusion criteria by type of disease (for the MSDs cited, "The various paralyses included should be coded, or at least carpal tunnel syndrome should be separately identifiable and consistently included into the same code by all Member States"; "The different types of bursitis to be included (site, acute/ chronic) should be defined and the coding should enable identification by site of bursitis").
- A more detailed classification of diagnosis should be used. Expressing disability as a percentage without any clear definition does not enable the severity of the consequences of the disease to be assessed. Also, because some States recognize diseases at different stages of development, it is important to distinguish incident cases from older ones which have become more severe during the reference year.
- States often collect data according to different criteria; for example, "The data from NL represent notifications from a selection of company physicians and is far from representative of the whole working population". "The data from S do not represent recognised cases, but cases reported by the employer and completed with the diagnosis from the physician". The data from Greece do not represent the entire workforce, which makes it difficult to compare them with the other data.
- The data reflect not only the occurrence of diseases, but also the way in which the concept of an occupational disease has been integrated into the social security system. "Even for severe diseases, e.g. mesothelioma or asthma, the reporting rate is likely to be low, if the financial level of social security is not affected by the decision (for example, the case of NL and S)". The questionnaires used in the study to determine the national recognition criteria for a sample of diseases should also be used for all other occupational diseases (including MSD).
- The current figures probably underestimate occupational diseases, especially those which may be caused by non-work-related factors (some MSDs, mental ill-health or fatigue). More harmonized data would improve analysis of this aspect.
- The medical diagnosis and causative agent should be coded separately, and diseases due to old exposures (cancer) clearly differentiated from those due to recent exposures (allergy), in the European Schedule of Occupational Diseases.
- Some diseases (respiratory allergies) should be notifiable; the problems of harmonization this may create are compensated by the benefit of rapid data collection.
- "It is advisable not to rely on only one source of information when supervision of health and safety at work is concerned".

Directive 89/391/EEC
Article 6.2d.
(The employer shall take the measures necessary for) "adapting the work to the individual, especially as regards the design of work places, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect on health".

Directive 90/269/EEC
Article 3.1.
"The employer shall take appropriate organizational measures, or shall use the appropriate means, in particular mechanical equipment, in order to avoid the need for the manual handling of loads by workers".

Directive 90/270/EEC
Article 3.2.
"Employers shall take appropriate measures to remedy the risks found, on the basis of the evaluation referred to in paragraph 1, taking account of the additional and/or combined effects of the risks so found"
(the risks being "risks to eyesight, physical problems and problems of mental stress").

Directive 89/655/EEC, as amended by Directive 95/63/EC, Article 5a
"Ergonomics and occupational health - The working posture and position of workers while using work equipment and ergonomic principles must be taken fully into account by the employer when applying minimum health and safety requirements".

Directive 98/37/EC
Article 1.1.2d, Annex I.
"Under the intended conditions of use, the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account".

Directive 89/686/EEC
Article 1.2.1.3, Annex II.
"Any impediment caused by PPE to movements to be made, postures to be adopted and sensory perception must be minimized; nor must PPE cause movements which endanger the user or other persons".

Beyond the figures

- 45% of EU workers describe their jobs as monotonous, and 37% say they do repetitive tasks. The pace of work (speed and deadlines) increased sharply between 1991 and 1996; 49% of workers claimed not to have been consulted on changes in work organization having an impact on their working conditions. The most common work-related health problems are back pain (30% of workers), stress (28%) and muscular pains (17%), (Paoli, 1997).
- The Eurostat pilot study (1999) indicates that MSD were among the ten most frequent occupational diseases in 1995: "Paralysis of the nerves due to pressure" (code 506.40, for example "carpal tunnel syndrome", 3,392 cases), "Osteoarticular diseases of the hands and wrists caused by mechanical vibration" (code 505.01, for example "arthrosis" of the wrist, 2,539 cases), "Angioneurotic diseases caused by mechanical vibration" (code 505.02, for example "hand arm vibration syndrome", 2,454) and "Diseases of the periarticular sacs due to pressure" (code 506.10, for example "bursitis" of the knee and shoulder, 2,305). The incidence calculated in the report differs widely from one State to another.
- In the United States, "*the number of repeated trauma cases increased dramatically, rising steadily from 23,800 in 1972 to 332,000 in 1994 - a 14-fold increase*" (NIOSH, 1997).
- In France, the statistics reveal a sharp increase in cases of MSD recognized as occupational diseases: 1981: 430; 1993: 3165; 1995: 4710, (CNAM, 1997). "*Overall, 3.4 million people - 28% of the work force - are exposed to MSD. Of these, 13% continually repeat the same movements at high speeds, 8% habitually work in stressful postures, and 7% do both*" (French Employment Ministry, 1997) (Hernan-Le Roy and Sandret, 1997).
- "*Overall, women factory workers are most exposed to joint strain, especially the lower-skilled ones, who account for 75% of those exposed*", chiefly in the leather, clothing and food processing industries, as well as in service industry jobs like check-out staff (French Employment Ministry, 1997).
- In the United Kingdom, during the period 1985-1995, "*The single most common cause of an over-3-day injury to employees was injury while handling, lifting or carrying (35%). (...) the proportion of handling accidents has remained constant since 1991/1992. In 1995/96, there were 44,404 over-3-day incidents, and 1114 major injuries reported to the enforcing authorities*" (HSE, 1997) (Dickinson, 1997).
- In Spain, in 1997, 64% of the workers interviewed said they had to stay in one position or perform repeated movements during part of the working day. Almost 45% of building workers, 35% of manufacturing workers and 30% in the service sector reported exposure to repeated movements for over half the day. 69% of workers who replied to the questionnaires claimed to suffer MSD in lower back, neck and chest. Manufacturing and building workers had more lumbar pains, while service sector employees suffered more neck problems (INSHT, 1998).

rehabilitation; and public health legislation covering prevention and treatment for the general public. These three systems are often interconnected and integrated differently in the different countries.

The first group of legislation is now mostly based on the common rules in the European directives, especially Framework Directive 89/391/EEC and some of its individual directives like Manual Handling Directive 90/269/EEC, VDU Directive 90/270/EEC and Directive 95/63/EC amending the Work Equipment Directive, all adopted under article 118A of the Treaty (see box opposite)[1].

The essential safety requirements for equipment design are laid down in Directives enacted under article 100A of the Treaty, chiefly Machinery Directive 98/37/EC (under review) and PPE Directive 89/686/EEC, and filled out in voluntary technical standards which give new products a presumption of conformity with the Directive (see box opposite). These technical standards are drawn up by CEN - the European Committee for Standardization - which is currently working on a series of draft European standards addressing aspects directly related to MSD (see A. Ringelberg's article p. 39).

It might be inferred from this that the broad statutory principles to protect workers' health were now in line, but that would be to disregard the differences which may appear when directives are incorporated into national legislation (Vogel, 1997 and 1998), in most cases as little more than the minimum requirements set at European level. The Community health and safety Directives may be a major gain in which the trade union movement's contribution was decisive, but many issues remain unresolved, such as the rights of workers' representatives (Walters, 1997) especially in small firms, the functions of multidisciplinary prevention services, health surveillance, MSD risk factors and other insufficiently covered risks (like vibrations and other physical agents), over-general prevention criteria, etc. Nor, of course, has there yet been an exhaustive evaluation of how the Community directives are being put into workplace practice in the different Member States.

In the medium-term, the legislative differences in countries applying to join the EU will also have to

[1] Article 13 "Pattern of work" of Directive 93/104/EC of 23 November 1993 (adopted under article 118A of the Treaty) concerning certain aspects of the organization of working time re-enacts article 6 of the Framework Directive and specifically refers to "breaks during working time" as one of the measures to be taken into account in order to adapt the work to the worker.

be reckoned with. The CEECs are hurrying to amend their laws to incorporate the acquis communautaire (established body of Community laws and regulations) which they had no hand in drafting, and so are finding it very hard to strike the right balance between their existing framework and the new European laws.

The second group of legislation - on occupational disease insurance schemes - is anything but harmonized. Commission Recommendation 90/326/EEC[2] updated the first European schedule of occupational diseases (dating from 1962) and added a further list of diseases whose occupational origin was suspected but not proven, recommending that Member States introduce them into their national laws. Six years later, however, the Commission Communication COM(96)454 recognized that diseases suspected to be of occupational origin were still different in each country. Mostly, they are still defined in exhaustive, insufficiently harmonized lists (e.g., Italy recognizes very few MSD, Germany a limited number, while France has a more extensive and detailed list). Often, there are also supplementary open lists of diseases for which workers can claim compensation if they can clear the difficult hurdle of proving cause-and-effect between their disease and working conditions.

The third group - public health legislation - reveals a striking division between occupational health policies and public health policies which often keeps epidemics of multifactorial work-related disease invisible - yesterday, asbestos-related cancers, now other occupational cancers, MSD, allergies. The costs created tend to be foisted onto the community health care system but, above all, the information "collected" by family doctors, specialists or hospitals is not used for collective prevention in the workplace, while information on workers' health is very rarely fed back into public health practitioners' knowledge bases. Any attempt to make occupational diseases more visible, reintroduce them into the prevention cycle, look for, identify, treat and prevent them by forging closer and more effective links between the different health sectors must be encourage (see box below).

Trade unions acting across the spectrum

Trade unions across Europe are engaged in an ongoing major offensive against MSD in widely differing ways according to country. The TUTB survey and task force meetings revealed that trade unions in the United Kingdom[3] have been campaigning on MSD since 1993, publicizing victims' fights to gain recognition for their complaint, training employee representatives in negotiating skills, stressing the economic benefits of prevention and, generally, putting out information to anyone capable of arguing the victims' case.

In France, the CFDT, for example, has mounted comprehensive campaigns in the metalworking, retail, and food industries focussed chiefly on the links between work organization, diseases and compensation. Also, the different union organizations have an effective say in decision-making bodies in the social security system and regional health funds. Their efforts have paid off in the form of two recently-published schedules on compensation for chronic lower back disorders caused by certain vibrations and those caused by the manual handling of heavy loads (Decree N°. 99-95 of 15.2.1999).

In Spain, the CC.OO. has concentrated on information and training for workers' representatives to promote surveys (to identify symptoms and risk factors) as a

Closer integration of public and occupational health

Local health authorities in Spain are setting up systems to detect and prevent certain occupational diseases with short latency periods as part of a redistribution of health responsibilities between the Autonomous Communities in a bid to bring to light disorders which escape the traditional national workplace policing systems (Factory Inspectorate, mutual insurance organizations).

Between 1993 and 1998, for example, the Barcelona CSL (*Centro de Salud Laboral* - occupational health centre) assisted by the medical services of five of the city's CAPs (*Centros de Atención Primaria* - early warning centres), identified 103 potentially work-related diseases, including 86 cases of MSD (66 women), chiefly in the cleaning industry, meat and retail trades and administrative services. 68 workers then agreed to meet CSCST (*Centro de seguridad y condiciones de salud in trabajo* - centre for occupational health and safety) specialists, and the disease was confirmed as having a work-related origin in 41 cases. In agreement with the workers, the CSCST then audited and recommended improvements to the working conditions in 19 workplaces.

Source: A. M., Sánchez Miguel, Programa Treball al CAP – Vigilancia y prevención de enfermedades relacionadas con el trabajo por los servicios de atención primaria de salud, Jornadas *Caducas o trabajas?* , CC.OO., Madrid, 25-26 may 1999.

[2] Annex I of the Recommendation lists other MSD than those considered in the Eurostat study (1999): 506.21 (*Diseases due to overstraining of the tendon sheaths*), 506.22 (*Diseases due to overstraining of the peritendineum*), 506.23 (*Diseases due to overstraining of muscular and tendinous integrations*), 506.30 (*Meniscus lesions following extended periods of work in a kneeling or squatting position*).

[3] Owen Tudor, "The TUC experience on campaigning on MSD" - ETUC Campaign on MSD - first preparatory meeting, Brussels, 17-18 March 1998.

basis for workplace negotiations to improve working conditions, increase the visibility of MSD cases, and gain recognition for them as occupational diseases. CC.OO. has worked with the TUC and LO-DK under the European Leonardo programme to produce training materials for prevention reps which can be used in awareness-building campaigns in the different countries. The focus for action has been metalworking firms (aeronautics industry) and those in sectors where the risks of fragmentation and growing job insecurity are particularly high, like hotel chambermaids, supermarket check-out staff, transport, clothing manufacture.

In Italy, CGIL, CISL and UIL handle compensation claims, but have focussed chiefly on direct workplace action to improve working conditions. The actions are usually initiated by local trade unions and led by the workers' representatives with strong technical backing from the local public health institutions and a highly proactive stance by the criminal courts.

Trade unions in Norway are working for public insurance systems to give individuals effective rehabilitation and a pathway back to work. Agreements have been reached giving workers the right to refuse to carry out certain types of very heavy handling. Danish unions have agreed on an action plan with employers to halve new MSD cases by the year 2000, and are rolling out industry-wide campaigns in the textile and food sectors, for example.

Reducing the incidence of MSD has been a primary aim of occupational health in Sweden since the Eighties; LO-S adopted a programme in 1991 on changing work organization to address MSD, one major success of which was the new regulations brought in in 1998 (see next page).

In 1997/99, trade unions - mainly in the United Kingdom, Denmark, Spain, France, Belgium and the Netherlands - brought in general programmes of action on MSD. The European federation of textile industry unions (FETHC) launched a joint industry study on MSD with the TUTB, the European federation of public service unions (EPSU) collected national experiences and the European federation of building and wood workers (EFBWW) put the issue at the top of its agenda. In the United Kingdom especially, self-help groups like the RSI Association and the National Back Pain Association also kept up the pressure.

Some trade unions have produced handbooks, tools and materials on how their national MSD campaigns were launched.

A European trade union communication strategy may be necessary to boost the effectiveness of national efforts. Suggestions have been made[4] on the fundamentals: starting the communication

Trade union awareness-building campaign materials

The following non-comprehensive list gives some idea of the range of materials produced by trade unions in Europe for their action and awareness-building campaigns.

- In the United Kingdom, the TUC's "*WRULD Campaign Pack*"; the Unison guide for trade union campaigns: "*A handbook for Unison safety representatives Campaigning on Health & Safety*" and its practical guides to the application of the Directives: "*Display Screen Equipment Regulations 1992*", "*Manual Handling Operations Regulations 1992*".
- In Denmark, the food industry union NNF mounted a wide-ranging campaign (1997) using depictions of assembly-line work, audiovisual materials, case studies, logoed items, leaflets, posters, etc.
- In Spain, CC.OO. (1998) staged conferences, produced risk assessment guides, posters, the information sheet *Eh!*, industry-specific training materials for the textile, retail/hospitality and metalworking industries, and role play-based schemes.
- In Germany, the media and printworkers' union IG Medien published an MSD information sheet "*TIP Gesundheitsschutz*" N°. 7 (1995), while the wood, building and metalworkers' unions GHK, IGM, IKK produced a brochure on manual handling of loads, with photos and drawings illustrating relevant solutions to practical problems "*Den Rücken schonen: Rükgrat zeigen*" (1998).
- In France, the CFDT (1997) set up training and seminars, and produced posters and leaflets describing case studies in the electronics industry and poultry processing plants (see "Dossier TMS: le travail en question" in *CFDT magazine*, N° 229, September 1997).
- In Belgium, the FGTB (1998) distributed an explanatory brochure on the issue.
- In Italy, documents were published on actions launched by industry federations like the FIOM (metalworking/car manufacture) in Turin (see Internet site, www.pmt.cgil.it/fiompie/626.htm) and the Milan branches of the CGIL, CISL and UIL's women's coordinating committee "*Donne-Salute-Lavoro*" ("*100 gesti al minuto. Donne o macchine?*") in electronics, industrial laundry, food, chemicals and service industries.

process by "active listening", taking care not to "inflate numbers, overstate facts and processes in order to impress public opinion" which "then may become convinced that nothing can be done in front of a thus overwhelming fate" resulting in distrust. The "media's habit is exactly to "shoot" a statement or a story, to handle it with the maximum of overtones for a definite period and then to let it drop abruptly. And this is the worst damage a social or political campaign can suffer".

Instead, we need to provide reliable scientific information, tell "the real story" of individuals and of groups, but also reach the audience in a relevant way which allows for their preconceptions and avoidance strategies (prevention/compensation, work/daily activities as causes of disease, active/passive acceptance of technologies, etc.). It is important to exchange ideas, observe behaviour patterns and learn the lessons of other experiences. Putting questions and problems rather than offering answers and solutions adds new dimensions to solutions that were not clearly understood and rallies support for the action.

National trade unions have campaigned on four types of demand:
• follow-up on European and national legislation and official measures;
• ensure that European regulations and technical guides are kept up-to-date;
• facilitate exchanges of experiences;
• ensure greater consistency in measures incorporating Directives into national legislation.

Pending the final version of the report commissioned by DGV from the European Agency in Bilbao on risk factors for work-related neck and upper limb MSD, a series of currently available key documents could provide a basis for regulatory or technical harmonization at European level:
• the new Swedish regulation (AFS 1988: 1, "Ergonomics for the prevention of MSD") which offers a cogent review of all risk factors for MSD, including psychosociological aspects, and the guide (available from: http://www.arbsky.se/provisi.htm) to apply it in practice (see M. Bjurvald's article p. 36);
• the guides and codes of practice published in some countries (Spain, Italy, United Kingdom, Norway) to implement the Manual Handling of Loads Directive[5];
• the integrated approach to risk factors proposed by an extended IEA panel of experts (1999) for the assessment of exposure to repetitive upper limb movement (see article by E. Occhipinti and D. Colombini p. 22);
• the controversy which has dogged the OSHA's attempts to draft ergonomic protection regulations since 1990 (see box) show the size of the problem, but also the hurdles to be cleared in trying to introduce into America a method of ergonomic risk management based on an - albeit not too onerous - obligation to carry out a preventive evaluation with participation by employees.
Clearly, awareness-building campaigns must continue to run alongside initiatives to tighten up the rules in order to increase public awareness of the problem. Training provision must also be developed for employee representatives at both local workplace level and transnationally to spread information on victims' rights, case studies which signpost possible solutions, methods of evaluating physical and psychosocial factors, and negotiating tools.

The OSHA draft standard: a benchmark document

The draft put out by the OSHA for discussion on the Internet excludes agricultural, construction and maritime activities. Where there are manufacturing or manual handling jobs in a workplace, the employer must set up a system to identify hazards and inform workers, which includes employee participation. Where workers have already reported MSD or a known hazard exists, the employer must set up a job analysis and hazard control programme, provide medical management and training, and evaluate the effectiveness of the programme. If the evaluation shows that the programme is not controlling the hazards, the employer must correct the deficiencies. If the evaluation shows it is functioning properly, the employer must keep the controls in place and evaluate them again after three years. The standard also includes a guide with practical information on carrying out risk assessments.

OSHA (1999), *Working draft of a Proposed Ergonomics Program Standard*. Available at: http://www.osha-slc.gov/SLTC/ergonomics/ergoreg.html

The challenges of prevention

Among the difficulties encountered in implementing measures to prevent MSD, unions report employers' resistance to change (United Kingdom), the pressure of the jobs shortage (France) and the failure of companies to see any financial benefit in it (Austria, United Kingdom).

Workers in all countries generally fear reporting their disease, with all that implies for prevention and compensation. A work-related incapacity may still put a worker out of a job. That seems to hold true for all countries, with varying consequences according to the state of collective labour relations. That is a striking comment on the balance of power in the

[4] G. Cesareo, "Suggestions for an ETUC campaign on MSD", ETUC Campaign on MSD - first preparatory meeting, Brussels, 17-18 March 1998.

[5] Min. de trabajo, INSHT (1998), *Guía técnica para la evaluación y prevención de los riesgos relativos ala Manipulación Manual de cargas*; A., Grieco, E., Occhipinti, et al. (1997), Manual handling of loads: the point of view of experts involved in the application of EC Directive 90/269, *Ergonomics*, 40, 10: 1035-1056; *Guidance on Manual Handling Operations Regulations*, UK, 1992; Lisbet Samdahl Hoiden (1997), Regulation in Norway on the subject - Manual Handling - Directive on heavy load and repetitive, monotonous work, *Proceedings of the 13th triennial Congress of the International Ergonomics Association*, 571-573, Tampere.

workplace and the failings of national employment legislation as well as the legislation incorporating the Framework Directive's provisions on workers' participation in managing their own health and safety.

Many companies, of course, have introduced so-called safety incentive programmes based on management bonuses. Unfortunately, these often put additional pressure on workers to keep quiet about their afflictions, and in most cases encourage under-reporting of accidents and especially diseases (Pransky, Snyder *et al.*, 1999).

Workers have to protect their jobs - even dangerous ones - and fragmentation of the workforce works heavily against this problem being put on the collective agenda. Workers also find it very hard to get the risks recognized and prove the link between their disease and their work. Trade union action is vital to break down this isolation, spread knowledge, provide tools and reassert the fundamental right to a job which is consonant with human expectations.

Trade unions have written guides to risk assessment - like Unison's *Work- it's a risky business* (1996) in the United Kingdom and the joint ISTAS/TUTB guide *Risk assessment at the workplace. A guide for union action* (Boix and Vogel, 1999). Methods usable by workers to analyse work organization and risks must be developed at national and workplace level. These methods must be based on existing data - like sick leave for disease or accidents -, but must also be open to the collection of new data, and focus on systematic job observation, symptoms audits, the analysis of work schedules and work pace. Data on the development of MSD by non-specifically exposed workers may also be necessary to compare incidence rates and so confirm the work-relatedness of disorders detected at work (Batevi, Menoni *et al.*, 1998).

Under European law, employers have a strict legal obligation to perform a risk assessment. Many, however, only carry it out and follow it up when forced by trade union action. Union reps can then socialize the experience of those actions by working out case studies and good practice.

A wide range of research and experiences with evaluating exposure to physical risk factors for MSD is under way using a variety of methodologies, some of which have been field-validated to varying degrees (Li and Buckle, 1999). Questionnaire-based methods have also been developed to evaluate the psychological aspects of MSD (Lindström, 1997). The National Research Council study (1998) describes methods of intervention and ways of evaluating the effectiveness of the changes achieved, by comparing a group involved in an intervention with another group which was not, or comparing observations made before and after the changes. Some of these results should be usable, bearing in mind that they need to be constantly improved and validated by research and experience with workers. Better than setting hypothetically "safe" occupational exposure limits would be to produce assessments by which to identify clearly unacceptable conditions or take immediate action and determine the direction of workplace changes to be promoted.

A previous issue of this *Newsletter* reported (Verde, 1997) on some of the tools which have been developed to identify the hazards and assess the risks of MSD in practice. Some are immediately usable, like "body mapping"[6] - a quick way for workers to describe their subjective symptoms by sticking different coloured self-adhesive flags to the parts of their own body where they have a particular feeling (red - pain, green - continuous pain, black - stress, etc.). Other methods, based on the observation and logging of working conditions, can be included in a participatory method which strikes the best practical balance between the requirements of rigorous analysis and immediate action to reduce the risks of MSD. The fact that some situations can only be described by using instruments of growing complexity and precision is no reason for putting off direct changes to jobs (see the article by J. B. Malchaire and N. A. Cock p.27). The TUTB is shortly to publish a compilation of risk estimation methods and proposed check-lists usable by machinery designers and union reps alike (A. Ringelberg, *Risk Estimation for MSD: Guidelines for Machinery Designers and Workers' Representatives*, TUTB, in press).

Generally, assessing MSD exposure takes an overall and complex approach: a psychosociological approach to tasks, a physiological one to movements, because the consequences flow from tasks or movements, or both at once, as well as existing social/workplace barriers, like the gender division of labour. So, a full and effective job analysis means taking into account the sector, organization (see F. Daniellou's article p. 32) and type of work - e.g., repetitive, monotonous - the work station and the distinguishing features of the workers, their type of training, and gender (Messing *et al.*, 1999).

Other key issues to emerge from the TUTB survey relate to the need for closer links between workers, their representatives, occupational health services and public enforcement agencies. Trade unions condemn the general difficulty in getting consistent diagnoses and effective treatment, and because these are relatively new diseases, occupational health doctors and inspectors are often unaware, unprepared, and in some cases, not sufficiently

[6] Body of Evidence, *Hazards 61*, January/March 1998.

independent from firms (United Kingdom, France, Greece, Spain).

The lack of properly harmonized diagnostic criteria[7], weak legislation, the need for a multidisciplinary approach, and the relative complexity of new analytical methods[8], make it essential for trade unions to have access to the technical and scientific expertise of public and multidisciplinary services. In the latter, which may administer employee's pay-related contributions (like the "Mutuas" in Spain), trade unions exert a decisive influence in increasing the effectiveness and reliability of their methodologies (Li and Buckle, 1997) and commitment. Effective links with potential sources of scientific expertise, the research community, occupational health doctors, as well as general public health agencies, ergonomists, designers, local, national and more broadly European public enforcement agencies must also be strengthened.

Compensation - disparate and insufficient

Compensation systems also differ widely between Member States, ranging from an excessive number of individual funds in Greece each applying different case assessment criteria, to a unified single national insurance scheme which in most countries covers most sectors, but again with national variations. The most striking differences are in the public sector and agriculture. Employment status is another area where systems differ, especially for self-employed and family workers, who are only partially covered. The Funds also have completely different functions in each country: some simply administer the medical, legal and compensation aspects (Italy), while others have significant powers to act directly in the workplace through information and risk prevention (France and Germany), and in research (INRS in France); they are often generalist but sometimes industry-based (Germany).

The TUTB study brought to light clear disparities between compensation systems, which in most cases cannot provide data of sufficient quality or quantity to mount preventive actions. Many scheduled occupational diseases are not actually admitted as such, and those that are differ from one country to another. The procedure may be started in very different ways with different degrees of decision-making independence and guaranteed protection for workers. In Italy, for example, doctors must report the suspected disorder to the inspection agencies, and so to the national legal service; in France, workers can notify their insurance organization and the labour inspectorate directly; in Spain, workers must inform their employer first, and trust in him to report it (Otero Sierra, Varona, Chau *et al.*, 1997).

In some cases, the statistics only include diseases from a specific degree of incapacity upwards. Compensation is set by reference to different degrees of incapacity, so the number of compensable diseases is always far fewer than recognized ones.

The functions of insurance funds are also totally different according to the country, so a worker's right to compensation for the same disease will vary from one country to another; it may entail costly legal proceedings (United Kingdom) and frequently a challenge to the decision taken by the agencies concerned (France, Italy, Austria, Germany). In most cases, compensation levels offer no incentive.

Finally, the key issue of permanent disablements and the opportunities offered victims for compensation through the criminal courts remains an open question. In most Member States, trade unions play a key role in giving workers legal advice. Striking a balance between compensation and prevention where the costs of the one are not a bar to the other are still in many cases a challenge to the union, employers and the public authorities.

Impact of selected MSD in Europe (1995)
(Incidence rate/million)
(Eurostat, 1999)

	506.40	505.01	505.02	506.10
EU	26	20	19	18
B	34	600	7	32
DK	0.4	15	49	13
D	0.3	7	3	6
EL	-	-	-	-
E	40	24	(*)	47
F	154	4	2	73
IRL	-	6	-	1
I	0.1	11	0.3	0.2
L	6	-	-	37
NL	-	-	-	-
A	1	6	(*)	2
P	4	1	-	29
FIN	14	-	8	23
S	48	23	19	6
UK	14	-	95	11

(*) Included under 505.01

The recent Eurostat report (1999) (see table p. 19 and note 2) confirms the lack of consistency between compensation systems in the different countries. Prevention must remain the top priority, but there should also be better and fairer guarantees of access to care, recognition and compensation of occupational diseases (and accidents) throughout

[7] See, e.g., report EUR 14768 EN written by a working group of the European Commission's DGV under Recommendation 90/326/EEC: "Information notices on diagnosis of occupational diseases", 1997.

[8] In a recent article: Occupational Musculo-Skeletal Disorders of the Upper Limbs due to Mechanical Overload, *Ergonomics*, Vol. 41, N° 9, September 1998; D. Colombini, E. Grieco and E. Occhipinti offer useful guidance for tackling MSD. Working from epidemiological data, they propose a methodology based on a new concise index for risk assessment (OCRA), a health surveillance system, and principles for equipment and work environment design.

the European Union.

More must be done to provide effective rehabilitation for injured workers and reaffirm the principle of adapting the work to the individual rather than the other way round.

Conclusions: pathways to action

While it has not provided a detailed panorama of country-to-country variations in risk - nor was it intended to - our survey has helped pinpoint certain key issues and emerging trends.
The findings of the Dublin Foundation, Eurostat and the national surveys - which, albeit incomplete, are significant pointers - confirm that MSD is a very widespread problem in Europe and is growing in the developed world. The replies to the questionnaires from trade union experts involved in the workface realities, confirm it to be a major problem.

There are two basic lines of attack through traditional trade union and legislative channels. Firstly, prevention, i.e., action to change existing working conditions (environment, organization) so as to eliminate MSD factors at source; and secondly, identification, remedial action, compensation and more effective rehabilitation when damage results from hazard exposure.

For prevention, **technical benchmarks for equipment design, validated by trade unions**, must be established. Notwithstanding the limits of the New Approach, setting stringent technical requirements in voluntary standards would be a significant achievement. Two key processes are currently under way: the Machinery Directive and standard EN 292 Parts 1 and 2 are being amended; and the prEN 1005 series of draft standards on safety of machinery to provide biomechanical evaluation methods for MSD risk factors are at the public inquiry stage. Also, the TUTB's "Ergonomics Guide" could itself soon become a type B European standard[9], thereby giving added importance to ergonomic design principles in machinery design.

However, prevention is above all a workplace issue between employers and workers faced with using equipment supplied by designers and manufacturers, and coping with new forms of work organization. Here, we have to address not just the gains but also the limitations of the framework of European laws as they stand, and the way they are incorporated, and especially implemented, in national law.

That framework could be improved by **new regulation at Community level, such as through a stocktaking of existing directives**, taking up the GMB's 1993 initiative for a proposal for a directive, and tightening the legislation up more in line with recent Swedish provisions. The draft directive on physical agents (vibrations), the conclusions of the Bilbao Agency's study of MSD for DGV and the national reports on the application of the VDU and Manual Handling Directives will be the basis for discussions on MSD in the tripartite Luxembourg Committee this year.

Matters could also be moved forward at national and European level by **harmonizing or just distributing the guides and codes of practice already produced in some countries**, like those on manual handling in Spain, the United Kingdom, Italy and Norway, and those on all MSD exposure situations in Sweden. **The various national trade unions absolutely must exchange experiences**. Rory O'Neill's brochure *Europe under strain*, shortly to be published by the TUTB, will give a bird's eye view of European and international trade union initiatives.

Workplace action requires **the most consistent, effective and recognized scientifically reliable instruments for the multifactorial analysis and monitoring of workplace safety and health conditions**. The IEA technical group document, for example, shows that an international consensus does exist on a methodology based on integrated multifactorial indicators which includes work organization elements (breaks) for the exposure assessment of upper limb repetitive movements.

Workers must validate the outcomes of using these methods in the workplace and feed back their findings as input to new preventive measures. Workers' representatives have a pivotal role in identifying and assessing the influence of work organization factors on MSD. The "Topic Centre MSD-good practices" set up by the Bilbao-based European Agency[10] will doubtless prove a key source of benchmarks in the matter.

Finally, the experiences and means of trade union action deployed in recent national campaigns could be incorporated in **targeted training and coordinated action schemes** at industry level or for transnational works councils, for example.

What the MSD issue also shows is how unfitted existing compensation and rehabilitation systems are to cope with an epidemic of injuries: differences between systems, unharmonized, uncodified diagnoses and causes, inadequate compensation, too few job rights, need to strengthen rehabilitation programmes. The Eurostat report at least offers a basis for improving the reliability and comparability of data. We must also - but this is beyond the scope of this article - look hard at the criteria used to set priorities for the use of social security resources and

[9] CEN/TC/AH wi 122083: *Safety of machinery - Guidance for introducing ergonomic principles and for the drafting of ergonomics clauses.*

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to guarantee consistent, high levels of public health in Europe.

Finally, we must continue to **strengthen the links between workers' representatives, public enforcement agencies, medical and multidisciplinary services**. Maximum effectiveness can be achieved for actions to prevent MSD by incorporating a multidisciplinary approach combining technical, medical and scientific knowledge and practices. It is essential to keep close tabs on the debate on the application of the Framework Directive's provisions on "preventive services" currently under way in the working group of the Commission's DGV Consultative Committee. The opportunity to build close and effective links with preventive services is a top priority, not just for across-the-board action in cases where conflict is unavoidable, but also where cooperation with employers is possible. ■

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Assessment of exposure to repetitive upper limb movement: an IEA consensus document

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This article outlines a consensus document on repetitive movement exposure assessment developed by the Technical Committee on Musculoskeletal Disorders of the International Ergonomics Association (IEA). The document is also endorsed by the International Commission on Occupational Health (ICOH). The main authors of the document are D. Colombini (co-ordinator) and E. Occhipinti (EPM), Italy; N. Delleman (TNO), Netherlands; N. Fallentin (NIOH), Denmark; A. Kilbom (National Institute for Working Life), Sweden and A. Grieco (University of Milan), Italy who also chairs the IEA Technical Committee.

The full document has yet to be submitted for peer review, but is extensively summarised here. More details on methods of application can be found in a special issue of *Ergonomics* (Colombini D., Occhipinti E. (1998), vol. 41, n° 9).

Aim

The consensus document sets out to lay down definitions, criteria and procedures for describing and, where possible, assessing work conditions that may physically overload the different structures and segments of the upper limbs. It is intended to provide all WSMD prevention practitioners with methods and procedures easily applicable in the workplace, based on observation procedures where possible.

The proposed methods are based as far as possible on knowledge and data gleaned from scientific literature: conflicts and failings are addressed by reference to international standards or pre-standards, on the basis of the researchers' experience and common sense.

General model of assessment and definitions

The description and general model of assessment for all exposed workers in a given situation aims to evaluate four key collective risk factors: repetitiveness, high force, awkward postures and movements, lack of proper recovery periods. These factors are assessed as a function of time (chiefly their respective duration). Other factors are also to be considered. These we have classed as "additional factors".

Each identified risk factor is properly described and classified. This allows special requirements and preliminary preventive action for each factor to be identified, and enables all the factors contributing to overall "exposure" to be accommodated within a general, mutually integrated framework. From this viewpoint, it may be useful to classify results quantitatively or by category. To this end, the definitions reported in Table 1 p. 23 are important. The suggested procedure for assessing the risk is the multistage one listed below:

- pinpoint the typical tasks of a job, including those which take place in equal repetitive cycles for significant lengths of time;
- find the sequence of technical actions in the representative cycles of each task;
- describe and classify the risk factors within each cycle (repetitiveness, force, posture, additional factors);
- reassemble the data on the cycles in each task for the whole work shift, taking into consideration the duration and sequences of the different tasks and recovery periods;
- produce a brief, structured assessment of the risk factors for the job as a whole.

Organisational analysis

Organisational analysis should precede the analysis of the four main risk factors and additional factors. It is essential to focus on the real **duration** of **repetitive tasks**, and the existence and distribution of **recovery periods**. The organised work shift may consist of one or more work tasks. In turn, each task may be characterised by cycles or other types of execution. If the task is characterised by cycles of mechanical actions, it will be defined as a **repetitive task**. If it is characterised by checking operations (examination, inspection) not involving movements or awkward mechanical actions, it will be defined as an upper limb recovery period.

Tasks with non-repetitive mechanical actions are defined as **non-repetitive tasks** (but not "recovery

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Table 1
Definitions of main recurring terms used in exposure assessment

ORGANISED WORK: The organised grouping of work activities that are carried out within a single work shift; it may consist of one or more tasks.

TASK: Specific work activity designed to achieve a specific operational result.

Tasks are classified as:
• *Repetitive tasks:* characterised by repeated cycles with mechanical actions.
• *Non-repetitive tasks:* characterised by the presence of non-cyclical mechanical actions.

CYCLE: A sequence of technical, mainly mechanical, actions, continually repeated in the same way.

TECHNICAL ACTION (mechanical): An action that implies a mechanical activity; not necessarily to be identified with a single joint movement, but rather with the complex movements of one or more body regions enabling the completion of an elementary operation.

POTENTIAL RISK FACTORS

REPETITIVENESS: The presence of events (i.e.: cycles, technical actions) that are repeated in time, always in the same way.

FREQUENCY: Number of technical (mechanical) actions per given time unit (actions per minute). High frequency is the related risk factor.

FORCE: The force exerted required by the worker to execute the technical actions.

POSTURE: The set of postures and movements used by each main joint of the upper limb to execute the sequence of technical actions that characterise a cycle.

Awkward posture: hazardous postures for the main upper limb joints.

RECOVERY PERIOD: Period of time between or within cycles, during which no repetitive mechanical actions are carried out. It consists of relatively long pauses after a period of mechanical actions, during which the metabolic and mechanical recovery of the muscle can take place. Lack of recovery is the related risk factor.

ADDITIONAL RISK FACTORS: These may be present in repetitive tasks, but not necessarily or always. Their type, intensity and duration lead to an increased level of overall exposure.

periods"). The number of cycles planned within a **repetitive task**, and the net duration of each cycle, must be counted at this point. The number of cycles often coincides with the number of pieces to be worked in each shift.

Risk factors

1. Repetitiveness - Frequency

Repetitiveness can be used to characterise tasks for assessment. For this, a repetitive task for the upper limbs can be defined as an activity of at least an unbroken hour in which the subject carries out a similar series of work cycles of relatively brief duration (a few minutes at most). Once repetitive tasks are submitted to analysis, there is the more important problem of quantifying and assessing repetitiveness.

In our proposal, repetitiveness is measured both by counting the number of technical actions performed by the upper limbs within the cycle, and by identifying, for each action, how many times (or for how long) they involved a given posture or movement of each main segment/joint of the upper limbs (see posture and movement analysis, p. 24).

Describing the technical actions often means filming the job, and reviewing it afterwards in slow motion. The company will often have records available describing and numbering the task, and timing the elements constituting successive technical actions (Time and Motion Studies).

Frequency is analysed by the following sequence:
• description of the technical actions;
• calculation of action frequency. From the work organisation study already conducted, we already know: the net repetitive task time, number of repetitive task cycles, duration of each cycle.

From the description of technical actions, we can calculate the number of actions per cycle, and hence the action frequency in a given time unit: **number of actions per minute**. We can also obtain the overall number of actions in the task(s), and consequently for the shift.

2. Force

Force more directly represents the biomechanical effort necessary to carry out a given action - or sequence of actions. The need to develop force during work-related actions may be related to the moving or the holding still of tools and objects, or to keeping a part of the body in a given position. The use of force may be related to static actions (static contractions), or to dynamic actions (dynamic contractions).

Force quantification in real life contexts is a problem. Because of field applicability problems, two different methods are recommended to evaluate the use of force associated with the technical actions present in a cycle.

■ ***Dynamometers***

This procedure is recommended for actions involving the use of levers, or components of machines and objects. A dynamometer can be used to determine the force required to move a lever, or, equipped with the proper interface, to simulate the same working action by the workers involved. Even so, not all technical actions requiring the use of force can be easily determined by means of dynamometers.

To evaluate the use of force, the field results obtained must be compared against a reference working population. For this, relevant data can be found either in the literature (Rohmert *et al.*, 1994) or sourced from national or international standards institutions.

■ ***Psychophysical rating scales***

Here, the worker's subjective evaluation is used to determine the physical effort associated with the cycle technical actions. Different psychophysical scales are available in the literature; we have used the "CR10 Borg scale" for perceived exertion.

While subjective scales are not completely error-free, if correctly used they do allow researchers to evaluate the effort associated with any technical action. The reference values for evaluation are provided by the scale itself.

The procedure, when applied to all workers involved, can be used to evaluate the average score among subjects for each technical action as well as the weighted average score for all actions and the entire cycle time.

Finally, whatever the method used to describe and assess force, it is necessary to evaluate:
• the average level of force required by the whole cycle, referred to as the maximum force capability, is defined by reference groups or the group of workers involved;
• whether the cycle includes technical actions requiring the development of force beyond given levels (peak force), and if so, which and how many.

3. Posture and types of movements

There is a clear consensus in the literature as to the potential damage wrought by extreme postures and movements of each joint, from protracted postures (even if not extreme) and from specific, highly repetitive movements of the various segments.

Moreover, the description of postures and movements of each upper limb segment during the technical actions of a cycle completes the description of the "repetitiveness" risk factor. The analysis of postures and movements focuses on each single upper limb segment (hand, wrist, elbow, shoulder): it aims to check the presence and time pattern in cycle (frequency, duration) of static postures and dynamic movements involving each segment/joint considered.

The description may be more or less analytical, but must assess at least:
• technical actions requiring postures or movements of a single segment beyond a critical level of angular excursion;
• technical actions involving postures and/or movements which, even within acceptable angular excursion, are maintained or repeated in the same way;
• the duration expressed as a fraction of cycle/task time of each condition reported above.

The combination of these description factors (posture/ time) for each joint will provide the classification of posture effort for each segment considered. It must be emphasised that at this stage, it is less important to describe every posture and movement of the different upper limbs segments than to focus on those which, by typology or excursion level (as well as by duration), are static postures and/or movements involving greater effort and also requiring improvement.

For an exhaustive description of postural risk, the following operational phases must be covered:
• a separate description of postures and/or movements for each joint - shoulder, elbow, wrist, hand (type of grip and finger movements) - and type of effort (static, dynamic);
• static postures: observation of static postures close to extreme articular range during the cycle/task time; observation of static postures in the articular mid-range held for a prolonged period of time; observation of grip positions during cycle/task time;
• joint movements: presence of articular movements near the limit of the range of motion during the cycle/task time; repetitive articular movements from the same technical actions (independently of the articular range) for at least 50% of cycle time and subsequently of task time.

For practical purposes, a significant cycle should be analysed for each repetitive task. This is better achieved by videotaping. The video can then be reviewed in slow motion to describe and evaluate the effort of each joint segment, making a distinction between right and left side when the effort is asymmetrical.

4. Lack of recovery periods

The recovery period is a time during which one or more of the muscle groups usually involved in the work tasks are basically inactive (macro-pauses). The following may be considered as recovery periods:
• work breaks, including the lunch break;
• periods during which tasks are carried out which do not involve the usual muscle groups;
• periods within a cycle involving actions affording complete rest to the usually active muscle groups; to be classed as macro-pauses, these periods must be at least 15 unbroken seconds.

Analysis of the recovery periods is a check on their duration and distribution within the cycle, and a macroscopic examination of their presence, duration and frequency within the whole shift. With some exceptions, represented by recovery periods for actions implying protracted static contractions, the description and assessment of recovery periods should be based on:
• a description of actual task sequences involving repetitive upper limb movements, "light" non-repetitive tasks, and pauses;
• the frequency of the recovery periods with reference to the actual number of working hours per shift;
• a ratio between the total recovery time and the total working time, in a shift devoted to tasks involving repetitive movements.

The main problem encountered in analysing recovery periods is the lack of criteria for an adequate assessment (duration, time scheduling).

In this connection, the following should be considered:

■ ***Static actions***
Classical muscular physiology studies (Rohmert, 1973) provide criteria with which to assess the adequacy of recovery periods as an immediate consequence of a static effort.
It should be emphasised, however, that such data refer to effects like performance or, at best, muscular fatigue but are not fully validated as respects major health effects.

■ ***Dynamic actions***
No adequate studies are available for evaluating the optimum distribution between repetitive work time and recovery time. The absence of consolidated scientific studies on the optimal distribution of recovery periods makes it necessary to refer to "rough" and empirical data reported in the literature or in guide documents and standards (Victorian Occ. HSC Australia, 1988; ISO TC 159 Draft/1993; Grandjean, 1986).

Logically, if not strictly scientifically speaking, all these documents tend to suggest that:
1. work involving repetitive upper limb movements cannot be continuously sustained for over one hour without a recovery period;
2. the recovery period within an hour of repetitive work must be in the range of 10-20% of working time (about 5-10 minutes an hour). These rough indications still to be perfected, may guide description and assessment methods for recovery periods for "dynamic" upper limb work.

5. Additional risk factors

Other factors apart from those already discussed are considered to be relevant in the development of WMSDs. They are always work-related, and must be taken into consideration when assessing exposure. They have been described as additional, not because they are of secondary importance, but rather, because each may be either present or absent in the various occupational contexts. For a factor to be considered, it must have an association with WMSD effects, as well as having a collective impact (that is on all or significant groups of the exposed subjects) rather than an individual impact (that is on single subjects). The additional risk factors may be mechanical, environmental or organisational. The list of factors cited here (table 2) is only indicative

Table 2
List of possible additional risk factors (indicative list)

MECHANICAL RISKS
- Hand-arm vibrations
- Extreme precision in positioning objects
- Localised compression on upper limb structures
- Use of gloves
- Rapid or sudden wrenching movements of upper limbs
- Blows and shocks (such as hammering hard surfaces)

ENVIRONMENTAL RISKS
- Exposure to cold
- Exposure to heat

ORGANISATIONAL RISKS
- Machine-paced task
- Incentive payment
- Routine overtime
- Working to tight deadlines
- Sudden peaks of high workload
- Lack of training

and not exhaustive: each operator will decide on what single factors are relevant to assess overall exposure in the circumstances.

Mechanical and environmental factors can be described and assessed according to the corresponding time pattern (frequency, duration). Organisational factors can be described according to category classifications (at least as present/absent).

Overall exposure assessment

An overall exposure assessment must account for different risk factors, individually described and classified. While the simplest and most elementary prevention actions can be implemented after proper analysis of each risk factor, more comprehensive prevention strategies must be based on an assessment of overall exposure as determined by the different combination of the risk factors considered. In this regard, the literature already offers data and convincing hypotheses on the interrelation between some of those factors. This notwithstanding, it must be said that in the present state of knowledge there is still insufficient data to outline an accurate, parametric general model, combining all the risk factors considered; particularly when the issue is to fix the "specific weight" of each factor in determining the overall exposure level.

Though accounting for this, we must stress the need for even partially empirical models for a concise assessment of overall exposure to the risk factors considered. Methods and procedures for determining concise exposure scores already exist in the literature (Keyserling *et al.*, 1993; Schneider, 1995; Mc Atamney *et al.*, 1993; Moore and Garg, 1995). A concise index has been recently proposed (Occhipinti, 1998) providing a classification of the risk factors considered here (repetitiveness, force, posture, lack of recovery periods and additional risk factors). This index model has been the subject of positive preliminary tests through epidemiological studies. It allows a classification of the results in a three-zone model, useful for implementing preventive actions following on from the exposure assessment process.

Mindful that the data supporting the above overall exposure assessment models are still wanting and often empirical, it is recommended that, if used, they should be approached "critically" in studies for preventive action and/or for the active health surveillance of workers. In this regard and with these goals, the following aspects should be considered:

- the exposure indices proposed at present have a methodological value, showing the concept of the integrated evaluation of risk factors;
- such indices have also a practical value: even if they do not provide an absolute statement of the exposure (and hence WMSD risk), they do at least permit a ranking of the exposure level derived mainly from the combination of the different factors in the different work situations. This allows action and intervention to be prioritised. At present, an index can only be used in combination with health status monitoring (complaints, disorders) of the workers involved, in order to determine whether the proper action and intervention have been chosen;
- the exposure indices proposed here are not intended as standards or reference values to distinguish safe or hazardous conditions: this should be made clear to potential users;
- the exposure indices proposed here, or in the future, need to be validated by laboratory studies, as well as by epidemiological studies (exposure/effect). ■

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Risk prevention and control strategy for upper limb musculoskeletal disorders

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Introduction

A trawl of the literature reveals many methods for assessing the risk of upper limb musculoskeletal disorders (ULD). They include checklists, assessment scales, observation techniques and even highly sophisticated measurement procedures. But these approaches developed and published by experts are open to two fundamental criticisms:

- they rarely take account of the expertise, technical possibilities and time available to those responsible for working conditions in workplaces of large, and especially small, companies;
- the aim of such people is not to evaluate risks, as scientists would, in the context of epidemiological studies, but to collect the information needed to improve working conditions and, if possible, avoid problems.

Employee participation usually ensures that significant control measures will be easily and readily found. An intervention study, therefore, requires a procedure through which for risk prevention practitioners to gather information progressively, as it becomes necessary to define appropriate control measures.

This paper proposes a procedure in four stages of increasing complexity, to be used successively, if necessary, by people with different expertise levels (Malchaire and Indesteege, 1997). It aims to help them recognise ULD risk conditions and identify the most appropriate corrective or preventive measures.

Description of the procedure

The philosophy behind the strategy is not specific to musculoskeletal disorders. It is usable in industry for the prevention of any type of risk (Malchaire *et al.* 1998a; 1998b; 1998c; 1998d; 1999).

- In stage I, "*Screening*", workers' complaints or disorders are reviewed and the working conditions rapidly inspected. A decision is then made whether to study the problem more in detail and look for ways of avoiding the risk and improving uncomfortable work postures.
- If this does not solve the problem, a stage II - "*Observation*" - is initiated by the company officials responsible for working conditions and workplace organization.
- If they cannot devise satisfactory solutions, specialist expertise is enlisted and a more detailed "Analysis" is carried out (stage III).
- If the "Analysis" still fails to turn up the necessary solutions, further expert assistance is enlisted for stage IV, "Expertise", targeted on a very specific aspect of the working conditions to single out final control solutions. (See table 1 p. 28: Characteristics of the four different stages).

Phase I: *"Screening"*

The method must be very easy to understand and use, preferably by the workers themselves who are thoroughly familiar with their working conditions. It must not be time-consuming, so that it can be used each time a problem is suspected. Table 2 (p. 28) shows different items that may be suggested to employees as a basis for discussing the circumstances, causes and simple improvements that can be made to eliminate the problem.

Phase II: *"Observation"*

The method must be easy to use in the field by those responsible for work organisation who usually lack training in musculoskeletal disorders. Again, the method needs to be rapid and low-cost. A checklist (table 3 p. 29) was developed, based on a proposal by Keyserling et al. (1993). It includes the main aspects of working conditions (postures, forces, and repetitiveness...) that might contribute to the development of an ULD. No limit is specified at this stage, the optimum situation being simply the one that requires the minimum rotation, twisting, forces...

Table 4 (p. 29) gives the four questions to ask for each item in the checklist. The participants (workers and the technical services) are invited to estimate whether the unfavourable item occurs "*sometimes*", "*often*" (suggested as about one third of the time) or "*always*", for the body zone concerned (neck, shoulders, elbows, wrists/hands). Again, rather than searching for a consensus on frequency, they are invited to consider the reasons for it and to look together for ways to avoid the situation or reduce its occurrence.

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At the end of the "*Observation*" stage, an overview of the risks before and after implementing the control measures can be had by counting the number of items occurring "*often*" or "*always*". This makes it possible to determine the overall efficiency of the proposed measures and the acceptability of the anticipated outcome. If the outcome is not acceptable, it is easy to identify the most exposed zone of the upper limbs, prioritise additional control measures, and determine the priority of a more detailed "*Analysis*".

Acceptability is a value judgement based on perception of the work. There is, however, no reason to believe that "*subjective*" evaluations by workers thoroughly familiar with their working conditions are less reliable than so-called "*objective*" evaluations by experts with limited knowledge of those conditions.

Table 1 • Characteristics of the different stages

	Phase I *"SCREENING"*	Phase II *"OBSERVATION"*	Phase III *"ANALYSIS"*	Phase IV *"EXPERTISE"*
WHEN ?	All cases	If problem	Difficult cases	Complex cases
HOW ?	Simple observations	Qualitative observations	Quantitative observations	Specialised Techniques
COST ?	Very low • 10 minutes	Low • 2 hours	Average • 2 days	High • 2 weeks
BY WHOM ?	Workers and company personnel	Workers and company personnel	Workers and company personnel + Specialists	Workers and company personnel + Specialists + Experts
Expertise				
• work	Very high	High	Average	Low
• ergonomics	Low	Average	High	Very high

Table 2 • Checklist for stage I: *"Screening"*

		YES	Comments
1	Some accidents involving neck, shoulder, elbow or wrist problems.		
2	Some workers complain of pain in any of these body regions.		
3	The same motions or actions are repeated every minute.		
4	Very high work pace.		
5	Some postures are very uncomfortable: twisting, arm raised, wrist flexion/extension…		
6	The work involves important, repeated arm and/or wrist effort.		
7	Hand efforts are heavy: tightening, grasping, pressing, hitting, gripping with the fingers.		

Table 3 • Checklist for stage II: *"Observation"*

1	The head deviates from a neutral position: in rotation, lateral bending, flexion, extension or twisting.
2	Specific postures and movements are imposed by a task.
3	In some work phases, the shoulder reaches down and behind the torso with the elbow stretched.
4	Some movements of the hand and forearm in the horizontal plane lead to significant shoulder rotations.
5	For some movements, the elbow is at mid-torso level or above.
6	Some operations require torsion of the forearm (ringing, screwing, ...).
7	At times, the wrist deviates from the neutral position: extreme flexion or extension, radial or ulnar deviation, prosupination.
8	The operator uses grips such as the followings: 
9	Some efforts for lifting, pushing, pulling objects or tools are greater than 2 kg.
10	The operator uses tools or objects weighing more than 1 kg per hand.
11	Some objects or tools are slippery and require a very tight grip.
12	The tip of the fingers is used for operations of pressing, pushing or pulling.
13	The work involves some static efforts: postures maintained for more than 1 minute.
14	The worker has to exert sudden efforts.
15	The work involves repetition of the same movements.
16	It involves rapid movements.
17	There is direct contact with objects, tools, edges or parts that are sharp or can induce local compression.
18	The operator uses the palm or base of the hand as a hammer.
19	The tool handle is too small or too large.
20	The tool handle leads to a non-neutral position of the wrist.
21	The operator uses vibrating tools.
22	The worker is exposed to cold, air draughts, or is in contact with cold surfaces.
23	The worker uses gloves.
24	The tools produce impacts in the hand and elbow.

Table 4 • Questions to consider for each item of table 3

1	Does this happen for any body zone? (neck, shoulders, elbows or wrists/hands)
2	Does it happen? 0: never 1: sometimes 2: often (more than 33% of the time) 3: always
3	What can you do to avoid this or to reduce its occurrence?
4	What would be the frequency if these solutions were implemented? 0: never 1: sometimes 2: often 3: always

Even so, it would be wiser to adopt a safety factor, and it is that a stage III "*Analysis*" be initiated immediately some items occur "*often*" for the same body segment.

Phase III: *"Analysis"*

In most cases, working conditions can be significantly improved and the risk of ULD eliminated through the "*Observations*" described above. In some cases however, the task involves a combination of postures and efforts, making it impossible to identify the risk operations immediately. A more detailed "*Analysis*" is then required. The method for this stage III "*Analysis*" again has to be fairly simple and based essentially on observations. It should give a semi-quantitative indication of the risk encountered.

The proposed method is an adaptation of the OWAS method (Karku *et al.*, 1977). A video recording is made of the work during a representative period, focused on the body zone of interest. The recording is later played back and, at regular intervals, 100 instantaneous pictures are observed (Louhevaara and Suurnäkki, 1992). The posture of the body segments in the zone of interest is compared to a set of reference postures defined in the literature. These are:

■ For the neck (Kilböm *et al.*, 1986):
• bending, neutral position or extension;
• left or right lateral bending or neutral position;
• left or right rotation or neutral position.

■ For the shoulders (McAtamney and Corlett, 1993):
• extreme extension, neutral position, light bending, average or extreme bending;
• adduction, neutral position, light, average or extreme abduction in the vertical and horizontal plane;
• internal rotation, neutral position or external rotation.

■ For the elbows (Grandjean, 1988):
• no flexion, light, average or extreme flexion;
• extreme pronation, neutral position or extreme supination.

■ For the wrists and hands (Armstrong *et al.*, 1982; Punnett and Keyserling, 1987):
• extreme extension, neutral position or extreme flexion;
• extreme radial deviation, neutral position or extreme ulnar deviation;
• type of grasp.

This analysis can be made globally for the recorded phase or separately for several elementary operations. This analysis of the video recordings cannot be used to evaluate forces. Instead, the estimation of forces was based on the opinions of the workers, expressed on the Borg scale (Borg, 1990), for each elementary operation.

The main aim for stage II - "*Observation*" - is not to encode angles or forces, but to understand the work process, to question its appropriateness and look for ways to improve economy of movement. Here, comparing procedures adopted by different workers performing the same task can lead very rapidly and effectively to the development of an optimum procedure and recommendations for adapting the workplace and educating the workers.

Nevertheless, from the analysis of the 100 pictures, a summary table can be devised to compare the percentage of time spent in an extreme posture with the threshold values recommended in the literature. The number of digital grips is recorded, along with the mean level of force and an index of repetitiveness. All the results are expressed globally and for each operation.

It is clear that this stage III "*Analysis*" method requires more knowledge of ergonomics from the users. It will also be more time-consuming and more costly. So, it is justified only in cases where no immediate solutions can be found. Assistance and leadership from ergonomists, occupational physicians or occupational hygienists with specific training in upper limb disorders is usually required.

Phase IV: *"Expertise"*

For some particularly complex working conditions, more sophisticated investigating methods may be needed to identify appropriate solutions. This is so, for instance, for some assembly lines where work is so fast and complex that even analysis of the video recordings cannot single out the movements to be improved or avoided.

In this stage, the investigation method is based on direct measurements of angles, muscle electromyographic testing, repetitiveness and speeds of movement. This requires sophisticated and costly transducers and recorders, used by a sample of workers during representative periods. Expertise is required. The results are expressed in terms of mean values of these parameters and/or percentages of the time during which threshold values of angles, forces, repetitiveness, velocities… are exceeded. Again, the main aim is not to quantify the risk itself, but to identify the most dangerous motions, postures and efforts, so as to determine how workplace organisation can be changed to eliminate the risk situations.

Conclusions

The proposed strategy should promote better organized surveillance of working conditions and more efficient prevention of upper limb musculoskeletal disorders. It has the advantage of establishing multi-level intervention by the different parties (workers, ergonomists and experts) according to their expertise and the difficulty of the problem. Essentially, stage I: "*Screening*" and stage II: "*Observation*" are carried out in-house, while specific expertise is enlisted in special cases when needed. ■

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Musculoskeletal disorders "sick" workplace syndrome

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Musculoskeletal disorders (MSD)[1] are conditions that involve tendons, sheaths, cartilage, vessels and nerves. But that does not mean that research into how they develop and how to prevent them should focus mainly on upper limb biomechanical stress.

Some of the mechanisms cited p. 33 are frequently involved, either through biomechanical stress, or through work-related mental stress (Derriennic, Pezé, and Davezies, 1997; Daniellou, 1999[2]).

One symptom of a wider syndrome

But it is significant that, generally-speaking, while manual and office workers develop MSD, other groups of workers may be affected in other ways.

Shop-floor supervisors in the same departments are often found to have problems. Production supervisors and shop foremen are under implicit company orders of what I call the "no excuses, just do it" type, i.e., they are made vehicles for the "top-down" flow of management instructions, with no scope for giving "bottom-up" feedback on routine problems with a view to identifying medium-term solutions. Fraught relations with workers can certainly be seen as a cause of MSD, but can also be interpreted also as attendant symptom and indicator of organizational failings.

MSD also frequently appears in a context where **senior and top company management** feel they lack control: they may be dependent on a main or single customer, part of a multinational - with an organization where even location decisions are taken elsewhere, not to say on a different continent -, or in an industry exposed to fierce world competition.

Employee representatives, if they exist, may also be caught up in this general process of rigidification. There may even be intense trade union activity, but focussed on some other specific work-related grievance, such as welding fumes, light bulb replacement, or "fair pay" of dirty work bonuses. MSD are also "a running sore" for employee reps who are untrained and unsupported in their work: MSD may be perceived as the most symbolic symptom of the exploitation of labour, to which no reply can be found within the economic system which created them.

Official prevention practitioners (occupational health doctors, safety, labour and social security inspectors) may well appreciate the grave consequences of a "surge" in MSD for the employees and for the survival of the firm alike. But this is not an area where systematic pathways for action are clearly open to them. There is no consensus on the "protocol" which could guide "treatment" as a "compelling benchmark".

Situations that give rise to MSD can be associated with **a general syndrome of a feeling of disempowerment**.

A blocked triangle

In many circumstances, the situation which accompanies (or induces) the onset of MSD can be depicted as a blockage in the triangle shown in the figure below.

- "Capacity to think" refers to the expert understanding of work; more specifically, understanding the relations between determinants of the work situation, the human activity carried out there, and the effects of it, both on production efficiency and the workers' health.

- "Capacity to act" on the work situation to bring about change is, of course, tied to the ability to devise the desired changes. But, reciprocally, the scope for thought is also connected to what it is believed can be done in practice. There is little incentive to think about something which you do not believe you have the power to change.

- "Capacity to debate", means accommodating the fact that the survival of the firm depends on more than just the interests of its shareholders. A wide range of stakeholders (shareholders, customers, suppliers, public authorities, the workforce, the general public) pass judgments on the company's efficiency, all of which may jeopardize it. The company's future depends on its members' abilities

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[1] This study considers only musculoskeletal disorders affecting the upper limbs (hand, wrist, elbow, shoulder).

[2] This article draws extensively on *Daniellou, 1999*, with thanks to the publisher, ANACT.

Organization / Activity / Biomechanical Stress / Injuries

- Inflexible job assignments prevent switching between jobs, so the same upper limb tissues are continually strained in the same way by the same movements repeated at high frequency.

- Inflexible work organization stops workers taking self-determined breaks when feelings of discomfort appear; this not only impedes immediate healing of micro-lesions, but actually worsens the damage.

- Operators are under strong pressure from their employers to keep up fast paces, especially through the oppressively watchful eye of shop-floor supervisors (Lima *et al.*, 1997).

- Inflexible organization and job layout do not encourage forms of mutual self-help which would enable some difficult tasks to be done in pairs, or by those workers best fitted to handle them.

- Older workers are not allowed to induct new recruits to pass on their safety know-how.

- Workers can rarely get unsuitable tools changed, even if the change would be beneficial.

- Workers on sick leave are not replaced, which increases the workload on those not yet affected.

- Work organization shortcomings create a domino effect of failings: by failing to address these, productivity calculations step up the pace of work.

- It is increasingly common for work organization not to set quantitative targets in terms of output, but "qualitative" goals like "total customer satisfaction": this can put limitless demands on the worker's personal contribution (Bartoli, 1998).

Organization / work-related mental stress / somatic complaints

- Work-related mental stress, especially fear, adds to general muscle tension, which is a key factor in the development of MSD. This pathway seems particularly key when the style of shop-floor supervision creates a constant climate of fear among employees (Lima *et al.*, 1997).

- MSD-generating situations are often found to include self-acceleration mechanisms, for which various explanations have been advanced (see Daniellou, 1999).

- Stress and its accompanying endocrine mechanisms probably play a key role, as may do immune system changes.

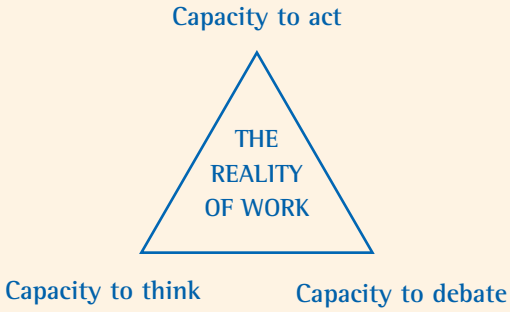
- Any of the mechanisms studied by psychosomatic medicine[3] may be helpful in explaining the emergence of injuries (see Derriennic, Pezé, Davezies, 1997 and Pezé, 1998, for example). This then brings the place of work in personal life as a whole into play. Pezé (1998) notes in particular that "the under-use of personal creative potential is a fundamental source of upset in the psychosomatic system".

- A growing number of authors have called attention to the manifestation of the disease as the end point of a spiral of pain and exclusion. The anxiety created when the first signs of the complaint are noticed compounds the general stress. Repeated absences increase colleagues' work load and change their attitudes. Proficiency declines, the error rate rises, and so the pace must be stepped up. Sznelwar (1997) writes: "The end point is illness". The onset of the disease represents a dead-end from which the only outlet is illness.

[3] Psychosomatic medicine studies how, in some instances, emotional disturbances may precipitate somatic complaints, i.e., bodily disorders. Contrary to the way in which the word "psychosomatic" is frequently used, it does not refer to situations in which people imagine themselves ill when in fact they are not: "psychosomatic illnesses" are not "all in the mind", but physical also.

to recognize and manage a range of challenges and conflicting approaches through internal and external negotiations resulting in adjusted, relevant compromises.

If the overall momentum between these three poles of thought, action and debate is blocked, there is every likelihood that MSD will develop along with the other symptoms described above[4]. In particular, there is often an observable, specific sequential link between uncontrolled productivity losses and increased pressure on the workers, which I call "vicious circles".



The "vicious circles"

In situations that cause MSD, there is often one or more "vicious circles" comprising three components:
1. a source of lost productivity undetected by the firm;
2. an attempt to compensate that lost productivity through direct pressure on work pace or the workforce;
3. an increase in lost productivity as a side-effect of that pressure.

To illustrate:

■ Franchi & Jabès (1996) identified a clear sequence in a motor vehicle equipment manufacturer:
• the know-how needed to achieve quality was not recognized; so
• agency workers lacked that know-how; therefore
• a growing share of the work load fell to experienced workers; consequently
• they left and were replaced by agency workers.

■ In studies of an electronic equipment repair shop, Guengant (1997) and Arnaud (1997) showed that 25% of the appliances were found to be faulty at final inspection and put back into the cycle. The company was unaware of this. But because time measurements did not take rectifications into account, the returns increased the work pace... mistake and reject rate[5]. Similar findings were made in a furniture factory by Baradat (1997) and Martin.

By quickly shedding light on least one of these "vicious circles", work study can bring all players to a realization that "something clearly has to be done". Showing the presence of a "vicious circle" stops people groping around in the dark for answers. It can open up pathways for organized action by a varied range of players to address the problems identified. But the possibility of action makes it intolerable for sufferers to stay as they were without something being done about it.

Giving new momentum

I would argue that preventive action against MSD must aim to gradually give fresh impetus to the dynamics of the above triangle, which in turn means organizing a wide range of players. In my view, that requires the same kind of organization and support as for a major investment project.

MSD are highly "political" problems which go to the very root of business management inasmuch as they involve working out trade-offs between different approaches. This requires active managerial support for treatment and prevention policies. It is risky to try and have them dealt with by technicians (e.g., consultants) alone, however competent.

Any large-scale action on MSD must be preceded by a "support-building" phase in which the key players in the firm (management, supervisors, employee reps, occupational health doctors) are progressively won over to the idea that it is a strategic issue, a major challenge to the company's survival, an opportunity for improvement in many areas - rather than one more of the purely medical problems usually left to the department head or foreman to solve as best they can with the occupational health doctor.

Without going into the technicalities of project management:
• it is important to identify and, where they exist, set up a group pulling together different areas of management responsibility, especially human resources, production, and customer relations, and for the occupational health doctor and ergonomist to attend its meetings[6];
• there must be coherent joint discussions in the different areas concerned (business policy, product properties, flow, work areas, machinery, tools, software, production organization, quality control, work organization, training, induction of young employees,...);
• there must be technical coordination of the activities carried out by one or more groups of designers;
• employee representative bodies (Safety, Health and Working Conditions Committees) must be allowed to play their full role;
• problems and choices must be examined by one or more working groups with relevant expertise as close to the jobs concerned as possible (production

[4] For more details, see Daniellou, 1999.

[5] This type of mechanism often explains why a 15% increase in work pace is necessary to get a 5% productivity gain.

[6] These different functions may not exist in a small firm, but wherever possible, there should always be more than one liaisee. An "employer + shop foreman" or "employer + personnel officer" arrangement is better than cooperation with just one company officer.

and maintenance workers, supervisors, foremen, inspectors, etc...);
• the measures implemented must be followed up and evaluated.

The issue is for the project put in place to be so structured as to give all the players a fresh impetus for thought, action and debate. This makes it essential that they should all be seen as workers with their individual constraints and difficulties, with a necessary and possible input to give into improving the situation, and not as at fault or conniving in the onset of MSD. Prevention of MSD may, therefore, put new issues on the workplace collective bargaining agenda. ■

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Swedish regulations on prevention of musculoskeletal disorders

Mats Bjurvald*

Background

Over the past two decades, work-related musculoskeletal disorders (MSD) have gained increasing recognition in Sweden, Europe and world-wide. Although the precise mechanisms behind the disorders/diseases are not fully known, there is much evidence that many of them are work-related. And scientific understanding of the etiological background of the disorders is continuously increasing.

Musculoskeletal disorders have now become very common and must be regarded as one of the major occupational health problems in Europe. Millions of European workers suffer from lower back, neck, shoulder, arm, hand or knee pain and/or problems. A conservative estimate is that at least a quarter to a third of European employees are exposed to physiological and/or organisational or psychosocial risk factors which put them at risk of musculoskeletal disorders. Personal suffering is not the only problem - these disorders are also a major cost burden for the individual, the company and society.

In its report "European Working Environment in Figures", the European Foundation for the Improvement of Living and Working Conditions (1996) concludes that "*priority in European prevention and improvement strategies should be given to actions targeted at the main and common risk factors which were identified as; - strenuous working postures, overload and extension of the body, musculoskeletal disorders; - psychosocial hazards, i.e. insufficient job content, strenuous working pace, lack of influence and control over one's own work, and other hazards related to stress...*"

The Swedish regulations

Sweden has had regulations on the prevention of MSD since 1984. (Minor amendments were made in 1993 to allow for incorporation of the EU Machinery and Manual Handling Directives). Even so, they continue to represent a major share of all work-related disorders, as evidenced by the fact that they account for about a third of all industrial compensation claims. To strengthen preventive provision against this type of problem revised Provisions (AFS 1998:1 Ergonomics for the prevention of musculoskeletal disorders) were introduced. As always in Sweden, the Provisions were produced in close co-operation with representatives of the labour market organizations (employers' federations and trade unions). The reasons for the revision were:

- the continuing prevalence of MSD in Swedish working life, which the existing regulations were clearly not addressing properly;
- to amend the Work Environment Acts 1991 and 1994 to give a better legal basis for regulating the problem;
- increased scientific knowledge;
- benchmarking; experiences from European standardisation and other countries' attempts to regulate the field.

The revision had two aims: firstly, to clarify the close relations between mechanical and psycho-social risk factors for MSD and the employer's responsibility to assess and control these risk factors; and secondly, if possible, to provide more specific, clear and quantitative guidelines or models for risk assessment for different situations. We believe both aims have been delivered.

The Provisions came into force on 1st July 1998. They are very general, covering ergonomic aspects across all sectors and, in accordance with the Swedish Work Environment Act, apply to all aspects of working life. This includes, for example, primary school pupils (6-7 years of age) and employed teleworkers. They are also compatible with AFS 1996:6 Internal Control, which implements the EC Framework Directive in Sweden.

AFS 1998:1 Ergonomics for the prevention of musculoskeletal disorders contains:

1. 12 mandatory clauses/provisions, five of which are addressed directly to employers. One clause each is directed towards employees, manufacturers/designers/providers, building developers and their consultants, co-ordinators of shared worksites and worksite controllers, respectively. Some idea of the flavour of the Provisions can be gained from these three sections:

Section 3
The employer shall ensure that work requiring the

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exertion of force is, wherever practically possible, ordered and designed in such a way that the worker can work with a work object, working equipment, controls, material or movement of persons without being exposed to physical loads which are dangerous for health or unnecessarily fatiguing.

Section 4
The employer shall ensure that work which is repetitive, closely controlled or restricted does not normally occur. If special circumstances require a worker to do such work, the risks of ill-health or accident resulting from physical loads which are dangerous for health or unnecessarily fatiguing shall be averted by job rotation, job diversification, breaks or other measures which can augment the variety of the work.

Section 5
The employer shall ensure that the worker has such opportunities of influencing the organization and conduct of his own work that sufficient variety of movement and recovery can be achieved.

2. Comprehensive general recommendations to help interpret the Provisions through background information and illustrations drawn from a wide range of different working situations. The recommendations are not mandatory, and also offer guidance on how to achieve compliance with the regulatory requirements.

3a. Instructional models as guidance for the assessment of risks due to strenuous work postures, manual materials handling, physically monotonous repetitive work and pushing/pulling operations. The models are based on a 3-zone, "traffic light" red-yellow-green rating system, signifying:
Red = unacceptable risk of musculoskeletal injuries. Action required.
Yellow = possible risk of musculoskeletal injuries. Evaluate further.
Green = acceptable risk for most individuals. OK, if no complaints.

3b. A general checklist for the identification of musculoskeletal stress factors which may have injurious effects.

The full English text of the Work Environment Act and the Provisions can be found at www.arbsky.se.

Relation to EC Directives

The Swedish position is that these Provisions fully implement the Manual Handling Directive, although we might expect some criticism for not using precisely the same wording as the Directive. The relation to the Framework Directive was mentioned earlier. The Use of Work Equipment Directive was implemented in Sweden by separate Provisions - AFS 1998:4 – which included a general clause on ergonomics. The VDU Directive was also implemented separately by Provisions AFS 1998:5 which contain a series of ergonomics clauses.

One pathway to improved ergonomic conditions is the production of sound ergonomics standards as part of the New Approach. For the Board, taking an active part in the harmonised CEN work is one way to give effect to the spirit of the new ergonomics Provisions, although the regulations themselves do not apply to products covered by EC Product Directives, like the Machinery Directive. So, the clause which provides that manufacturers, importers, suppliers and providers "*shall as far as is practically possible ensure that the technical devices, substances and packaging delivered do not cause physical loads which are dangerous to health or unnecessarily fatiguing...*", only covers **non**-EC product Directive products. The Machinery and other Product Directives are separately implemented by other Provisions.

Key aspects

The two most conspicuous features of the new ergonomics Provisions are probably the strong emphasis on the "psycho-social/organisational" side of MSD and the assessment models respectively. The two most salient psycho-social concepts in the new Provisions are work organization (a very wide concept) and autonomy. One of the 12 clauses deals specifically with autonomy. The assessment model for repetitive, monotonous work is based on four factors:
1) work cycle length;
2) work postures and working movements;
3) autonomy; and
4) work content and learning.

The assessment models were introduced as general recommendations only after protracted and comprehensive discussions. Every attempt to establish simple evaluation models or guidelines will be a compromise between our existing knowledge of the very complex factors behind the MSD and the need of good, practical "working tools" for employers, safety delegates and labour inspectors. One risk with over-simplified evaluation models/guidelines is that of accepting apparently "green" conditions which actually contain aggravating factors which should rate it as "yellow" or even "red", and vice versa. The response to the new Provisions in Swedish workplaces points to a mainly positive outcome.

The shortage of good scientific knowledge in the field of ergonomics remains troublesome. There has been a tremendous increase in general knowledge over the past decade, but many of the underlying aspects of MSD remain a mystery. Nevertheless, Sweden has found that a case still exists for more

stringent regulations, especially for the majority of the working population. Many jobs in Sweden are still too heavy or unsuitable in other ways for most women, not to say many men. There is still a long way to go before the aims of the Work Environment Act are fulfilled - that if you enter a job as a young healthy person you should have a fair chance of reaching retirement age in the same condition. This will be our task for many years to come.

Ergonomics is a fascinating dimension of the working environment, combining physiology, biomechanics, technology, psychology and sociology. There are still many gaps in our scientific knowledge. But we all have experience of what it means to do heavy lifting or work in constrained postures, and so there is a vast body of common knowledge which is not yet scientifically validated but desperately needing to be so. In other words, we must always be very open-minded and apply a holistic approach when dealing with these problems. And, finally, there is the great benefit that good ergonomic conditions almost always go hand in hand with good productivity and productive efficiency. ■

References on Swedish regulations

• Ergonomics for the prevention of musculoskeletal disorders, AFS 1998:1, NBOSH, Solna, Sweden.

•Internal Control, AFS 1996:6, NBOSH, Solna, Sweden.

•Swedish Work Environment Act, H8, 1998, NBOSH, Solna, Sweden.

European standards and risk assessment for MSD: challenging the future

J. A. Ringelberg *

The early days of standardisation for MSD

In 1985, CEN[1] set up a specific Technical Committee on Ergonomics (CEN/TC122) with the backing of Technical Committee 114 Safety of Machinery. In 1988, the "Biomechanics" Working Group held its inaugural meeting in Nijmegen in the Netherlands. The EU's Manual Handling of Loads Directive (90/269/EEC) was in the pipeline, and it seemed a good way to use the standardisation process to push through a risk assessment method for manual handling. The Netherlands (Netherlands Standards Institute, NNI) offered to supply the secretariat and convenorship. In 1990, the European Commission's DGIII and CEN/TC122 decided to change the Working Group's remit from "health and safety at work" to "safety of machinery" under the Machinery Directive (89/392/EEC)[2]. In 1993, three parts of prEN 1005 were sent out for first public enquiry. This produced a demand for more emphasis on machinery design and taking account of key A-standards on machinery that had been published in the meantime. The approach and requirements of these standards are now included in the new four parts of prEN 1005. (Comments on the first three parts were canvassed in the second public enquiry in December 1998; the first enquiry on part four opened in November 1998).

Ergonomics experts and work-related musculoskeletal disorders

Experts from thirteen European countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden and United Kingdom) are involved in drafting these standards on manual handling, recommended forces, evaluation of working postures and repetitive handling at high frequencies. They are all ergonomics practitioners, but with different scientific backgrounds and practical experiences: economics, industrial organisation, occupational health, occupational psychology, physiotherapy, biomechanics, applied mechanical engineering, kinetics and industrial design.

The main issues on which we had to harmonise our different approaches to reach a consensus were:

- *ergonomics*: fitting the job to the user or the user to the job?
- *gender*: is it enough for the Machinery Directive's essential safety requirements to envisage only male workers, or should we try and accommodate male and female user equally? Why not combine both sets of gender requirements? Are we protecting women or encouraging discrimination? These issues triggered off an ethical, practical and philosophical discussion about equity, equality and risk assessment;
- *legal status of harmonised standards*: how to accommodate potential discrepancies in the status of standards stemming from differences between national legal systems;
- *state of the art*: how to incorporate different scientific and practical approaches, such as publishing in international literature or the direct application of research findings in guidance and standards.

Although the task of CEN Working Group experts is to work out a consensus document which reflects the state of the art in science and practice, individual experts normally argue the "position" in their own national standards committees which in turn often act as a mirror group for European standardisation. Developing standards for "human physical performance" as part of CEN's machinery safety standards programme remains quite a challenge. Better communication and understanding between ergonomists, machinery safety and machinery designers is still essential.

Machinery Directive and human performance

The Machinery Directive expressly requires safety to be designed into machinery. Machinery manufacturers must take into account the capabilities of operators and incorporate both physical an psychological aspects. Discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account[3].

The prEN 1005 series includes methods to enable machinery designers to make a risk assessment. These standards have to present the available information on human physical performance, not just for

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[1] CEN: European Committee for Standardisation, Rue de Stassart, 36, B-1050 Brussels

[2] 89/392/EEC and latest version including several amendments: 98/37/EC

[3] 89/392/EEC, Annex I, 1.1.2.d: "Under the intended conditions of use, the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account."

selected future users, but as much as possible for all occupational and domestic users. It is for designers and manufacturers to make the risk assessment and decide which part of the market their product is intended for. The results of the risk assessment should be clearly described.

Second Enquiry for prEN 1005 Parts 1, 2 and 3

Part 1 presents the relation between physical performance parameters (body dimensions, postures and movements, force requirements) and different ergonomic standards (EN 547-1-2-3, EN 894-3, EN 1005-2-3-4). Terms and Definitions (like *action, general working population, grip of object, manual handling, operator, recovery time, rest, risk assessment, shift*, etc.) used other parts are given.

Part 2 presents a risk assessment approach on manual handling for machinery manufacturers. Eliminating the hazard by excluding the need for manual handling is the first "solution". If there is no alternative to manual handling, a risk assessment must be performed.
The main risk factors for *machinery/objects* (e.g., mass, size, grip/handles, etc.), the *operator-machine interface* (distances from the body, frequency of operation, working postures, etc.) and *environmental hazards* (like vibration, climate, temperature, etc.) are described. Machinery design recommendations to achieve a low level of risk for manual handling are given.
If these ergonomic criteria are not met, a risk assessment must be performed. The standard offers three methods, all with the same basis but differing in complexity of application. Each contains three steps:
• consider the mass constant in relation to the intended user population;
• assess the risk factors;
• identify the action required.
Work sheets are included to facilitate the procedure. The risk assessment methods are an amalgam of existing NIOSH methods, research results, literature and the experts' own experiences. They are to be used by designers and experts and reviewed for feedback to make future improvements. A follow-up study could be very useful.

Part 3. The main recommendation on force application is that the operator should have control of the operating sequences and pace of the machinery. The machinery must also be designed in a way that actions demanding force exertion can be performed optimally with respect to the body and limbs and the direction of force application. Recommendations are given to act on the factors affecting risks, like working posture, acceleration and movement precision, vibration, man/machine interaction, personal protective equipment and external environment (temperature, lighting).

The risk evaluation is based on the assumption that decreasing fatigue during work helps reduce musculoskeletal disorders. A three-step risk assessment model is described. The first step is to establish, for relevant actions, the maximal isometric force generating capacity of intended users (Step A). This force is reduced according the circumstances under which it is generated (velocity, frequency and duration of action) by a set of multipliers, until it may be delivered without substantial fatigue (Step B). The maximal attainable force is then reduced to values associated with the different zones of risk (recommended, not recommended, to be avoided) during the intended use of the machinery (Step C).

First enquiry for part 4 of prEN 1005

A five-step design process flow chart is given (establish the user population, perform a task analysis, identify the ergonomic data required, evaluate at the drawing-table/CAD-screen, evaluate with users). The standard presents figures and tables with working postures and movements divided into three categories (acceptable, conditionally acceptable and not acceptable). The risk evaluation is based "on the U-shaped model" which proposes that health risks increase when the task approaches either end of the curve, i.e. if there is little or no movement, or if movement frequencies are high (i.e. 2 per minute or more).

These standards represent the current state of progress in some areas of ergonomics and prevention of MSD, and could be helpful tools for improving the safety of machinery.
Collecting practical experiences on the use of these standards would be the first step towards their further improvement. ■

Key European MSD standards under development in the framework of the Machinery Directive:

• **prEN 1005-1:**
Safety of Machinery
Human physical performance
Part 1: terms and definitions

• **prEN 1005-2:**
Manual handling of objects associated to machinery

• **prEN 1005-3:**
Recommended force limits for machinery operation

• **prEN 1005-4:**
Evaluation of working postures in relation to machinery

• **prEN 1005-5:**
Risk assessment for repetitive handling at high frequency

New turns in the debates on occupational health management systems

This *Newsletter* has regularly reported the ongoing debates on occupational health management systems, most recently in issue 7, p. 19. Hot on the heels of CEN's refusal to start standardization work in this area, the (tripartite) Luxembourg Advisory Committee came out against a European technical standard on occupational health management systems and decided to set up an *ad hoc group* to help the European Commission work out guidelines. The groundwork should have been completed by June 1998.

Community still at work

Things have gone much slower than planned. The planned Commission document never made it off the starting blocks, not least due to downsizing and cutbacks in DGV's occupational health resources. Its initial idea of inviting tenders for outside assistance in drafting a document never materialised, and the Commission felt it was not equal to the task without outside help. That is why the Luxembourg Committee's ad hoc group's inaugural meeting in October 1998 had no Commission document to work on, and was instead left to consider various national documents. Its second meeting was held in Dortmund in March 1999 just ahead of a conference hosted by the German government under its presidency of the Council of Ministers.

The adoption of a Community document on OHM systems was a clear priority[1] for the German government. Its working assumption seems to be that better self-regulation by employers counts for more than laying down hard-and-fast rules on the outcomes to be achieved, so the new German government is proposing a massive watering-down of the content of the proposal for a Directive on physical agents in the workplace, keeping from the original text only a vague overall approach and rules on preventing vibrations.

The Luxembourg Advisory Committee's ad hoc group has been considering a document prepared by the German representatives. It offers a useful summary of the fundamentals of an occupational health management system, but also contains a series of suggestions unacceptable to trade unions: in particular, the idea that an integrated occupational health system would also include employee selection; or that improved prevention must result in higher profits. Nor does it take full account of the wide range of preventive systems in Europe: some things which may be relevant to the German situation are less clear-cut in the context of other European countries.

The Dortmund conference of 18 and 19 March 1999 gave an overview of the many - sometimes conflicting - initiatives and arguably illustrated the grey areas in the current debates.

The international state of play

Mr Hortensius of the Dutch standards institution (NNI) reviewed international developments. In 1997, the ISO (the international standards organization) decided not to go ahead with a technical standard on occupational health management systems. However, its General Assembly did adopt a resolution in 1998 calling for a survey of member organizations on national standards, and for the question of an international standard to be put back the agenda for the future.

The survey findings were published in January 1999. Of the twenty-five national standards institutions replying to the survey, five had adopted documents on occupational health management (Australia, Spain and Thailand as technical standards; the Netherlands and the United Kingdom as reference documents). Some countries (Argentina, India, Jamaica, Poland) were planning to adopt a document in the not-too-distant future; while others had OHM documents stemming not from standards bodies but other organizations: public authorities, professional associations, etc. In a final batch of countries, OHM documents had been considered but shelved due to various objections.

While ISO is very unlikely to start working out an occupational health management standard

[1] The German initiative is based on a 1997 agreement between the federal and Länder authorities, the industrial injury insurance organizations, the employers and trade unions, which resulted in a reference document for developing and evaluating occupational health management system concepts. The final version was published in February 1999: "Occupational Health and Safety Management Systems", IIIb2-36004.

in the immediately foreseeable future, the prospect cannot be ruled out in the medium-term (5 or 10 years). Consistency between the different types of standard on aspects of business management is a problem. Quality control standards (the ISO 9000 series) were followed by environmental protection standards (ISO 14000 series).

An ad hoc group run by NNI (Dutch standards institution) was set up to work out guidelines for use in developing different management systems standards. In particular, it will address:

- feasibility study requirements to verify the need for specific management system standards;
- methodological guidelines for standards development (especially standards planning, validation and revision);
- guidelines on a common framework to improve standards consistency and compatibility.

A number of organizations active on the certification market also seem to have partnered up with standards institutions to devise a de facto international standard (not officially recognized by ISO). It draws heavily on ISO 14001 and is scheduled for completion by summer 1999. Its registered designation will be HASAS 18001.

Underestimating key policy issues

The working assumption behind most debates on formalizing occupational health management systems is one that we heartily endorse. The overall organization of work is what is injurious to health. Dispersed, individual risk-focussed prevention is not very efficient, and many strategic choices made by firms (choice of technology, use of subcontracted and casual labour, enforced flexibility, etc.) are at the root of health problems. So it makes sense to insist on the employer's responsibility and, in complex organizations, to clearly demarcate central management's role so as to avoid dilution of responsibilities.

While reference documents can be genuinely helpful in guiding targeted action by employers and checking whether the firm has an overall prevention policy, they in no way relieve the public authorities from their responsibility to lay down clear rules on the general aims, specific requirements and procedures to comply with. Such rules must be backed up by effective inspection systems and penalties. Nowhere in any European Union country do these systems work satisfactorily. Penalties for flouting safety rules, in particular, are derisive compared to the immense human costs of employer criminality (between 6,000 and 8,000 deaths a year in the European Union for officially recognized industrial accidents alone).

For as long as most of the strategic choices mentioned continue to be regarded as employer's prerogatives, prevention is unlikely to make headway without tighter social controls over those choices. Companies are not motivated by the health of their workers. That seems to be a requirement imposed externally partly by the workers themselves, partly by the limitations that society and the public authorities decide to place on the entrepreneurial freedom of economic operators (e.g., banning child labour, or the use of certain substances, etc.).

This can be seen from the vastly differing occupational health policies applied by multinational firms in the countries where they operate. Profit-seeking and voluntary self-regulation do not deliver high occupational health goals for all workers. Social pressure, the balance of power in the workplace and society, the legislative framework and the effectiveness of public enforcement systems and penalties, etc. are all equally decisive factors.

Many of the current debates on occupational health management systems work on the assumption that workers and employers have a common interest in improving prevention. This is not borne out in reality. In practice, a wide range of situations are to be found. In some cases, especially where ill-health also results in a visible cost for the firm, there is a measure of common interest. In others, convergent approaches are possible through compromise. In yet others, there is conflict. Generally, two dominant trends can be discerned:

- The further away you get from traditional recognized and compensated risks, the less strategies converge. So, it is easier to agree on plans to reduce industrial accidents than to attack factors which affect mental health.

- The more casualised jobs are, the less of a priority prevention is. In times of mass unemployment, the trend is to manage risks through manpower selection and turnover, especially in un- or semi-skilled jobs. That, moreover, is what is most questionable in

economic approaches to occupational health, where prevention practice is dictated by cost-benefit analysis: where a job is devalued, so too is the worker's health.

No rolling back the functions of the public prevention system

Experience in different countries (Australia and the United States, in particular) has shown that formalizing OHM systems often produces weaker public enforcement of prevention requirements.

In the United States, occupational health management systems have been used by firms to escape routine labour inspectorate checks. Relying on third party assessments (carried out by commercial companies in line with market standards), the labour inspectorate self-curtails its powers and takes action only in exceptional circumstances (usually serious or fatal accidents).

While there appears to be no immediate danger of this in western Europe, employer pressure to go down that road should not be underestimated. The problem becomes particularly disturbing seen in the light of pressures to subordinate labour law to global trade rules. There is always the possibility that in occupational health just as in environmental protection, multinational firms will demand effective immunity where they apply management system which purport to deliver the aims set by national laws.

Likewise, applying OHM systems to subcontractors could be put forward as an alternative to the essential extension of existing employer's liability rules to the entire production cycle over which the firm has control regardless of the law by which its relations with the workers concerned are governed.

Preserve workers' independent action and the professional independence of prevention practitioners

Occupational health issues are closely intertwined with national industrial relations systems in ways which vary immensely from one country to another. The trade unions have consistently stressed that technical prevention alone is not enough. Workers must be able to express their needs, set their priorities, frame independent, collective strategies. The very few empirical studies suggest that the level of workers' collective activity (chiefly through an organized trade union) correlates positively with the level of health protection.

What occupational health management systems do is to demand that all workplace stakeholders help implement a prevention programme devised by company management. This is a dangerous road to go down, for it completely bypasses the trade union and the industrial relations procedures in which it has a large say, and erodes trade union autonomy in the name of a consensus around a "safety culture". We believe that workers' collective autonomy must be preserved in every stage of preventive action. That is what will bring to light new or ignored problems, make them visible. It is also what will enable actions to promote health which appear to conflict with the demands of production or the management chain of authority. Finally, it is what can take the problems beyond the factory gate and give impetus to the political debate on the changes needed.

One characteristic of management systems pattered on ISO 9000 standards is that they essentially work top-down. Central management makes a policy and sets objectives, and implements procedures to deliver them. Any apparent increase in workers' empowerment in its execution is strictly controlled and confined within a prescriptive frame of reference.

The independent action of specialized prevention practitioners (occupational health doctors, industrial hygienists, ergonomists, etc.) must also be preserved. Practice shows the importance of their approaching working conditions from a standpoint other than that of the business.

The acid-test of practice

A large number of firms already operate ISO 9000-based quality management systems, and a growing number also apply the ISO 14000 series environmental management standards. In some countries, occupational health management systems drawing on the general principles of these standards have been introduced (in a wide range of guises ranging from statutory internal control systems under labour inspectorate supervision in Norway and Sweden, to voluntary systems which may be backed up by certification procedures).

Rarely, it seems, are the debates based on a systematic detailed assessment of the practice. And yet changes to management systems have a very real impact on working conditions. To get a true picture of that impact, we feel two fundamental questions must be asked:

- do they increase workers' empowerment, or go the other way and strengthen the company's command and control systems?
- do they promote cohesion among workers, or divide if not create competition between them?

Conclusion

One assumption rarely aired in the current debates is that more self-regulation by employers could give a decisive boost to prevention if it is backed up by a genuine commitment to occupational health and a rational organization to implement the policy.

We believe this assumption is not borne out in practice for a number of reasons.

- So complex are production organization and health problems that occupational health problems cannot be effectively managed at workplace level alone. Take protection against carcinogens, for example: it seems clear that the essential link in improved prevention lies in public health policies which integrate occupational health. Epidemiological research, the development of substitutes, measures banning certain substances, the use of medical surveillance to aid prevention, are all part and parcel of a public policy.

- While some occupational health problems are related to failings which also affect production (e.g., accidents, inadequate control of different forms of pollution, etc.), others by contrast are related to production itself, work pace and subordinating human work to production goals (e.g., enforced flexibility of working time). In this second area of problems, an integrated management approach works against the essential non-profit-driven objective scrutiny, and in the best-case scenario will lead only to a sort of "best achievable" trade-off, delivering only that level of occupational health protection which is compatible with the demands of increased productivity. ■

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EU chemicals legislation under scrutiny

On 18 November 1998, the Commission adopted a Report on the operation of the four key EU laws on the classification, packaging and labelling of dangerous substances and preparations, the evaluation and control of the risks of existing substances and restrictions on the marketing and use of certain dangerous substances and preparations[1].

The four legal instruments were assessed on how they were achieving their objectives of protecting human health and the environment in the context of the Internal Market.

The Commission's Report was in response to public concern about chemicals in use in the Internal Market and the discussions of the April 1998 Informal Environment Ministers Council in Chester.

The report identifies a series of issues that need to be addressed to improve their operation. Generally, the findings stress the need to use the instruments more efficiently and to implement as well as enforce them more rigorously and consistently. They need to be streamlined and updated to take account of new emerging problems, such as endocrine disruptors.

The findings recognise the important role of sound science, but highlight the need to meet more fully the concerns of the outside world by giving full consideration to the *precautionary principle*.

At Chester, the Commission proposed that the stock-taking exercise should include a public brain-storming with all stakeholders - Member States, industry, consumers, NGOs, scientists, the European institutions - to focus on remedies for the future in the light of the review's findings.

This brainstorming exercise under the auspices of the heads of DG III and DG XI (Commissioners Bangemann and Bjerregaard) was held on 24 and 25 February 1999.
It was structured into three parallel sessions, entitled "Burden of the past", "Hazard vs. Risk" and "Challenge for the Future". The main speakers in each session (alternating between industry, the competent authorities and an NGO) put their cases around the following key questions:

Burden of the past
- What has been achieved so far and what remains to be done?
- How good is our current understanding of the issue?
- Why is a review needed?

Hazard vs. Risk
- What are the pros and cons of hazard and risk assessment?
- How can hazard assessment, risk assessment and other approaches be used for risk management?
- How should cost-benefit assessments be included in the process?

Challenge for the Future
- What should be the responsibilities of the different stakeholders?
- Where should the emphasis lie?
- What mechanisms can be used to accelerate the process?
- How can the efficacy of risk management be improved?

There was a measure of agreement between participants that the EU had some useful instruments, but opinions differed widely as to whether they are used efficiently, how they can be improved, what other kinds of instruments should be developed, and who should foot most of the bill for risk assessments, for example.

The main points discussed were:
- Existing provision for hazard identification, risk assessment and risk management is quite complicated and not especially useful for dealing with existing substances let alone new problems like endocrine disruption or phthalate migration in soft PVC toys.
- The existing legal instruments focus more on cure than prevention, when the opposite is required.
- One major concern is the number of chemicals which constitute the "burden of the past", and for which little data is

[1] Directive 67/548/EEC on the classification, packaging and labelling of dangerous substances, Directive 88/379/EEC on the classification, packaging and labelling of dangerous preparations, Regulation (EEC) 793/93 on the evaluation and control of the risks of existing substances, Directive 76/769/EEC on the restrictions on the marketing and use of certain dangerous substances and preparations.

available, especially on eco-toxicity and bio-accumulation.

- There is no consensus about the scale of the problem - how big is the burden? Is it the 100,000-plus chemicals suggested by some, or EU industry's lower estimate of 1200?
- For how many of these chemicals have the hazardous properties been identified? According to the US Environmental Defense Fund, the "minimal" toxicity data required by the OECD is not publicly available for about 75% of the 3,000 chemicals in large-scale use.
- Of the 110 priority chemicals selected for risk assessment since 1993, the technical work has only been completed on 19 to date.
- The time from selecting a priority chemical to an agreed risk assessment report can be as long as four years. How can the process be speeded up?
- Are the risk assessment requirements an obstacle to the process?
- Should substances be grouped by chemical properties and / or use?
- Should "targeted" rather than "complete" risk assessments be used more often?
- What about chemicals which are known to cause cancer, or which are mutagenic, or toxic to reproduction? Does their risk assessment need to be supplemented by a cost-benefit analysis prior to managing the risk?
- Should a lack of sound scientific evidence stand in the way of action when faced with problems like carcinogenicity etc.?
- How can the commitment of Member States, the Commission and industry be secured (implementation and compliance are handled differently in the different Member States)? How can the necessary financial and human resources be made available? How can the efficiency and effectiveness of the legal instruments be improved?
- An integrated and coherent approach to the EU's future chemicals policy must be developed which adequately reflects both the precautionary and sustainability principles.
- What are and should be the responsibilities of the different stakeholders and on whom should the onus of proof lie?

Based on the conclusions of the review of the four major legal instruments, and taking the discussion and different viewpoints of this brainstorming exercise into account, the Commission will prepare a Communication to the Council and the European Parliament on the way forward for chemicals legislation in the EU. The Communication should set out the strategy for the future, including any legislative options.

How the Commission will reconcile the differing interests of the various DGs involved in chemical policy-making remains to be seen. Even more important is how the different interest groups like consumers, environmental groups and trade unions will overcome their overt or concealed rivalries. Nobody will seriously claim that we can or are willing to live without chemicals, so a balance needs to be struck between real or imagined diverging interests, and not just in Europe. ■

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SLIMming down Directive 67/548/EEC

One of the cornerstones of EU chemicals legislation, Council Directive 67/548/EEC on classification, packaging and labelling of dangerous substances[1], is currently under review. Since January 1999, it has been a target of the so-called SLIM exercise (Simpler Legislation for the Internal Market), launched by the Commission in May 1996 to identify ways of simplifying Single Market legislation[2].

"Simplification" in this context means that internal market legislation must "be made more accessible and easier to understand, in particular by improving the quality of that legislation through consolidation and by more consistent and comprehensible texts"[3].

But: "the objective of simplification must preserve the acquis communautaire and the pursuit of Community harmonisation in the sectors concerned where necessary and in particular the requirements of health protection, safety, fair trading, environmental protection, worker protection and consumer protection contained in those rules"[4].

The first phase of SLIM covered Intrastat (the system for collecting intra-Community trade statistics), construction products, the recognition of diplomas, and ornamental plants. This was followed by VAT obligations, the Combined Nomenclature for External Trade, fertilisers, and banking legislation.

The current fourth phase of SLIM covers company law, pre-packaging and dangerous substances, as announced at the Internal Market Council of May 1998 and proposed by ECOSOC and the European Parliament in their reports on the previous phases of the Commission initiative.

The SLIM team

Under the SLIM procedure, small groups of experts - four or five representatives each of national governments and users - are called together for each topic. They are chaired by a nominee of the Commissioner responsible for the legislation concerned. Other Directorate Generals directly or indirectly concerned by the topic can send observers.

The teams are set a fairly short deadline (6 months or less) in which to come up with recommendations to simplify the legislation.

The group dealing with Dangerous Substances Directive 67/458/EEC started work on 22 January 1999 and completed its task at the end of May. The Member States represented are Denmark, France, Portugal, The Netherlands and the United Kingdom. The user side comprised representatives of industry and trade union associations as well as environmental and consumer groups.

What is Directive 67/548/EEC about?

The Directive was adopted in 1967 and has been amended 8 times and adapted to technical progress 25 times since then. It lays down common provisions on classification and labelling and basic requirements for the packaging of dangerous substances.

Substances are considered dangerous if they meet one or more of the fifteen criteria[5] established so far, describing the type and severity of adverse effects the substance may cause ("intrinsic hazardous properties").

"Existing" substances[6] must be classified and labelled in line with these criteria by the competent authorities[7], whereas "new" substances have to undergo a notification

procedure and risk assessment before they can be placed on the market.

The Directive also sets specific requirements for specific groups of substances[8] and a streamlined notification procedure for substances placed on the market in small quantities[9].

Nine annexes set out:
- the substances classified as dangerous (Annex I);
- the testing methods to determine the dangerous properties of substances (Annex V);
- the danger symbols or the wording of standard phrases on the nature of special risks (R-phrases) or safety precaution phrases (S-phrases) relating to the handling and use of dangerous substances used for the labels (Annex II to IV); or
- detailed criteria for the proper choice of the class of danger and how to assign the danger symbols, R- and S-phrases to a tested substance (Annex VI);
- Annexes VII and VIII relate not to the classification or labelling of substances, but to the notification of "new" substances; and
- Annex IX includes provisions on childproof fastenings and tactile warning devices as special packaging and labelling elements.

Impacts on other fields of legislation

There are links between this Directive and other areas of European legislation like:
- the export and import of certain dangerous chemicals;
- worker protection (e.g. lead, asbestos, carcinogens, or chemical agents as such);
- biocidal products;
- pesticides;
- pharmaceutical products;
- cosmetic products;
- the restriction of marketing and use of certain dangerous substances and preparations;
- animal testing; or
- the risk assessment of existing substances.

In a broader setting, the Directive's provisions are discussed in international fora which deal world wide with the harmonisation of existing national systems for the classification and labelling of dangerous substances.

Why review Directive 67/548/EEC?

Council Directive 67/548/EEC is not the only piece of legislation currently under review. On 18 November 1998, the Commission adopted a report of findings on the operation of the four key EU laws on the classification, packaging and labelling of dangerous substances and preparations, the evaluation and control of the risks of existing substances and the restrictions on the marketing and use of certain dangerous substances and preparations (see previous article).

The report identified for each legal instrument a number of issues that need to be addressed with a view to improving its operation. Failings criticised in Directive 67/548/EEC include:
- the time-consuming procedure for reaching harmonised agreement on the classification and labelling of dangerous substances and publishing them in Annex I to the Directive;
- the complex system of R(isk)- and S(afety)-phrases;
- under-enforcement of the classification and labelling provisions;
- the difficulty of tracing chemicals not classified as dangerous under the Directive;
- holding back innovation and competitiveness in the chemical industry, especially in the fields of polymers and intermediates, and difficulties gaining exemptions for research and development;
- the time taken to circulate notification dossiers and other information among the national Competent Authorities;
- the massive cost in staff and time needed to carry out a proper risk assessment;
- the complicated structure of the Directive as it has evolved over more than thirty years;
- the failure to produce an official consolidated version.

The group's recommendations will be presented to the Internal Market Council in June 1999. ■

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[1] Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

[2] On the simplification process see also Molitor Group: deregulation assault on health and safety, TUTB *Newsletter*, N° 1, October 1995, pp. 2-3. For French translation: "Le groupe Molitor: la santé et la sécurité au centre d'une tentative de dérégulation".

[3] Council Resolution of 8 July 1996 on legislative and administrative simplification in the field of the internal market (96/C 224/03).

[4] *Ibid.*

[5] such as "explosive", "very toxic", "carcinogenic" or "dangerous for the environment".

[6] Existing chemicals are those which were placed on the Community market before 18 September 1981 and are listed in the European Inventory of Existing Commercial Chemical Substances (EINECS). "New" chemical substances are those which are not in EINECS.

[7] And provisionally by the manufacturers, distributors and importers.

[8] e.g. polymers or substances used for research and development.

[9] Less than one tonne per annum per manufacturer.

Health and safety impacts of the new Amsterdam Treaty

The Amsterdam Treaty came into force on 1 May this year. It changes the legal underpinnings of European health and safety policy, which is now governed by articles 136 to 140 and 143. Article 118A (cooperation procedure) is replaced by article 137 (co-decision procedure), which covers a wider field of working life: a better working environment and improved safety and health protection for workers, working conditions, information and consultation of workers, equal employment opportunities, integration of people shut out of the labour market. Articles 138 and 139 lay down the stages of the procedure for consulting the social partners, and the Commission's role in the Social Dialogue.

The Amsterdam Treaty will also affect the work and composition of the Luxembourg Advisory Committee, which will remain a key forum for consultations on health and safety issues. The Advisory Committee should be consulted at the same time as the two-stage consultation of the social partners (article 138). The practicalities of this new procedure have still to be clarified. The Committee is currently discussing its future working procedures, which should be finalized in the autumn.

The new Treaty will also directly affect the proposals for directives on the European Parliament and Council tables. The co-decision procedure (article 251) will apply to all the pending proposals on health and safety issues: scaffolding, transport, physical agents and explosive atmospheres. The first readings in Parliament should remain valid, but will have to be endorsed by the new Parliament in September. That will probably delay the adoption of the ATEX Directive, for which the European Parliament had already given its second reading opinion (last May). Parliament should start work on the second amendment to Work Equipment Directive 89/655 (which aims to cover scaffolding, in particular) after the elections. For physical agents, the German Presidency put forward a text restricted to vibration-related risks. Although this won a consensus amongst most of the national delegations to the Council, it finds less favour with the Commission, whose own proposal encompassed all the risks related to physical agents to establish a strategy of overall protection of workers against physical agents. No progress has been made with workplaces on means of transport since 1993 when the Commission presented its amended proposal for a directive after the opinion of the Economic and Social Committee and the European Parliament's first reading opinion. ■

Information on the Amsterdam Treaty: http://ue.eu.int/Amsterdam/en/treaty/treaty.htm

ILO estimates over 1 million work-related fatalities each year

Over one million work-related deaths occur annually according to ILO estimates, and hundreds of millions of workers suffer from workplace accidents and occupational exposure to hazardous substances worldwide, the Chief of the ILO's Health and Safety programme told delegates assembled in São Paulo at the opening of the 15th World Congress on Occupational Safety and Health on 12 April 1999.

Addressing the introductory session of the Congress, Dr. Jukka Takala pointed out that the workplace hecatomb of 1.1 million deaths exceeds the average annual deaths from road accidents (999,000), war (502,000), violence (563,000) and HIV/AIDS (312,000). Approximately one-quarter of those deaths result from exposure to hazardous substances which cause such disabling illnesses as cancer and cardiovascular, respiratory and nervous-system disorders. He warned that work-related diseases are expected to double by the year 2020 and that if improvements are not implemented now, exposures today will kill people by the year 2020.

He also said that by conservative estimates workers suffer approximately 250 million occupational accidents and 160 million occupational diseases each year. Deaths and injuries continue to take a particularly heavy toll in developing countries where large numbers of workers are concentrated in primary and extraction activities such as agriculture, logging, fishing and mining - some of the world's most hazardous industries.

Also, according to ILO, some 600,000 lives would be saved every year if available safety practices and appropriate information were used:

- every year, 250 million accidents occur causing absence from work - the equivalent of 685,000 accidents every day, 475 every minute, 8 every second;
- working children suffer 12 million occupational accidents and an estimated 12,000 of them are fatal;
- 3,000 people are killed by work every day, 2 every minute;
- asbestos alone kills more than 100,000 workers every year.

ILO estimates show that the fatality rate in advanced industrialized economies is almost half that of Central and Eastern Europe, China and India. In the Latin America/Caribbean region, the fatality rate is even higher and in the Middle East and Asia (excluding China and India), the fatality rates soar to four-fold of that in the industrialized countries. Some particularly hazardous jobs can be from 10 to 100 times riskier. Construction sites in developing countries, for example, are 10 times more dangerous than in industrialized countries.

Industrialized countries have seen a clear decrease of serious injuries as a result of structural changes in the nature of work and real improvements in making the workplace healthier and safer, including improved first aid and emergency care which saves lives in the event of accidents. However the evolving nature of work is generating new occupational hazards, including musculoskeletal problems, stress and mental problems, asthmatic and allergic reactions and problems caused by exposure to hazardous and carcinogenic agents, such as asbestos, radiation and chemicals.

The ILO is emphasizing that key occupational safety and health conventions, such as the framework Convention N°. 155 on occupational safety and N°. 161 on occupational health services should be considered as minimum standards. In addition, the *Global Safe Work Programme* is being launched to provide knowledge, advocacy and services in occupational safety and health and to place this high on the global, international and national agenda. ■

Source: ILO News, April 1999

Second amendment of Carcinogens Directive adopted

On 29 April 1999, the Industry Council adopted Directive 1999/38/EC amending for the second time Council Directive 90/394/EEC on the protection of workers from the risks related to exposure to carcinogens at work.

As set out by the Council in 1997, the amendments to the earlier directive will lay down standards against the risks from so-called genotoxic mutagenic substances and include hardwood dusts as carcinogenic substances. The new

Directive also extends the scope of Directive 90/394/EEC to cover vinyl chloride monomer, and the Directive currently covering this substance (78/610/EEC) will be repealed.

The Directive incorporates most of the European Parliament's first reading amendments, especially:

- extending the Directive's provisions to all types of hard wood dust;
- applying the same limit value (5;0 mg/m^3) to mixtures of wood dusts; and
- revising the limit values for vinyl chloride monomer and wood dusts within 2 years of the date of the adoption of the Directive on the basis of the latest scientific data.

By contrast, the EP's second reading recommendations on additional information for SMEs, informing the EP on developments in standards on measurement techniques and a shorter implementation period have not been taken up.

Member States have until 30 April 2003 to transpose the Directive into national law.

European Week 2000 against MSD

The European Agency for Safety and Health at Work (Bilbao) will stage the next European Week of Safety and Health in October 2000. Preparations for the Week will start in autumn 1999 and continue throughout 2000, culminating with European Week events in all Member States in October 2000.

The theme for European Week 2000 will be the prevention of work related musculoskeletal disorders (MSD) with special emphasis on back pain. It is an issue high on the Member States's priority lists because of the large number of workers affected and the economic costs involved.

The European Parliament has voted a budget for it, half of which will be used to co-fund national projects put forward by Member States' national health and safety authorities after consulting the social partners through their various normal procedures. The aim will be to promote activities at workplace level. Special emphasis will be put on projects to exchange good health and safety practice and disseminate information to small and medium sized firms (SMEs). Half the budget for funding projects will be earmarked to support SME information activities. The Agency is setting up a working group for the Week that will include a representative from the ETUC/TUTB.

The Agency is looking into the possibility of setting up a European Week 2000 feature on its web site (http://osha.eu.int) to provide updated information on how the Week is progressing.

Standardization in the 21st century

15-17 March 1999, Berlin

Directorate General III (Industry) and DIN (German standards institution) co-hosted a major conference on the future of technical standardization in Europe. Four parallel breakout sessions discussed standardization and EU enlargement to the Central and Eastern European countries; promoting standardization to business, especially SMEs; the role of European standardization in a global economy (can the new approach work on the international scene? what role will the WTO play?); the future of standardization: what is the scope for it in the service sector or other sectors of society, like the environment?

There was no formal section on health and safety, but the issue was aired in discussions. The TUTB contribution to the Conference debates "Technical standardization and the working environment. TUTB participation in European standardization work" can be found on our web site: http://www.etuc.org/tutb.

The TUTB also manned an exhibition stand in the conference building hall, where we presented the databases consultable on our Internet site. ■

AFETT/TUTB training seminar Work equipment

Europe under Strain

by Rory O'Neill

Europe Under Strain is part of a set of materials - along with this special report - produced and published by the TUTB for the ETUC campaign on musculoskeletal disorders.

Trade unions across Europe are playing a widespread role in many important and very different ways to assess and prevent MSD. And not just in Europe: trade unions in North America, Japan, New Zealand and elsewhere are also active in the struggle. We felt it important that information on what they are doing should be collected and widely publicized.

Europe Under Strain is a companion publication to the special report on MSD contained in this double issue of our Newsletter. The brochure is a down-to-earth source of detailed information, and a step towards a more detailed examination of trade union schemes. But it is also a practical guide for prevention initiatives at both workplace and industry levels.

It provides an easy introduction to technical matters and a basic understanding of the different trade union approaches. As well as an overview of the issue of MSD, it presents case histories and studies on promoting occupational health, facts about working conditions and applicable European legislation, and the ergonomic principles which can help improve workplaces.

A selected bibliography, plus a list of useful addresses of agencies, trade union organizations and Internet sites round off this immensely useful review of the complex problem of MSD and what trade unions think can be done to prevent it. ■

Europe Under Strain, Rory O'Neill,
ISBN: 2-930003-29-4,
available shortly in English only.
Information and orders: Janine Delahaut, TUTB, e-mail: jdelahau@etuc.org

Integrating Gender in Ergonomic Analysis. Strategies for Transforming Women's Work

Joint action-oriented research by Quebec University and trade unions

Ed. Karen Messing

Scientists, employers, decision-makers and even women themselves seem to have difficulty in coming to grips with women's work-related health problems. This stems partly from traditional perceptions of women's work. The widespread belief that women's jobs are safer than men's means that women's health problems are dismissed as women "not being up to the job" or "imagining it". This has held back efforts to improve their occupational health. Prolonged standing which leads to problems of circulation, or repetitive movements which cause micro-strains, seem much less dangerous than the risk of falling from scaffolding or metal saw injuries.

For a number of years past, the Montreal-based CINBIOSE - the Center for the study of biological interactions in environmental health - has been conducting research to give visibility to and gain recognition for aspects of women's work which are bad for their physical or mental health. This research stems from the concerns and needs voiced by women workers themselves. Most of it is conducted in partnership with the three main Quebec trade unions. Through their scientific research and commitment to healthy and safe workplaces, the team aims to shed light on what has so far remained invisible.

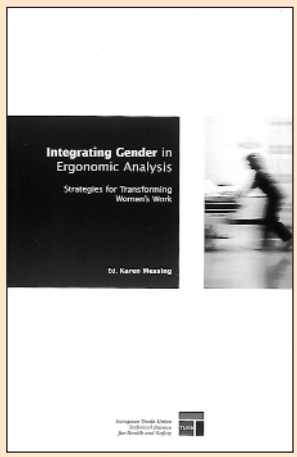
A series of case studies on women's work-related problems show how repetitive movements or stressful postures can result in musculoskeletal disorders. From cleaners through food industry workers (poultry processing) to bank cashiers (who work standing up in Quebec), many women work in jobs where they develop non-specific MSD. Karen Messing and her team point up the interactions between gender, work organization and working conditions.

We thought this was a lead which should be brought to European attention. It shows the immense contribution that action-oriented research can make to improving equal opportunities and working conditions. ■

Integrating Gender in Ergonomic Analysis. Strategies for Transforming Women's Work, Joint action-oriented research by Quebec University and trade unions. Ed. Karen Messing

ISBN: 2-930003-34-0, 192 pages, 15.6 x 24 cm, 1999
Price: 800 BEF (19.83 euros)

Published in French as: *Comprendre le travail des femmes pour le transformer*, ISBN: 2-930003-33-2



TUTB-SALTSA Conference

Working without limits? Re-organising work and reconsidering workers' health

25-27 September 2000, Brussels

European working life in the 1990s underwent profound changes and new forms of work organisation emerged. Expressions like down-sizing, lean production, just-in-time, flexible hours, teleworking, outsourcing, contingent work, casualisation, internationalisation and multi-skilling are being used to describe different aspects of these changes, but the overall trend is towards dissolution of known rules and limits, not least employment security.

The health effects of these organisational changes are far from sufficiently known, but impacts on the mental and physical well-being of workers can readily be imagined.

Not just academic analyses, but also knowledge based on workplace experience can help to identify the problems arising from these organisational changes, giving visibility to many ignored or underestimated health effects. It can contribute to a better integration of workers' needs in the political agenda and the more systematic inclusion of working environment aspects in collective bargaining.

This conference is a joint undertaking by the TUTB and SALTSA. It will focus on a selection of branches and sectors, on which parallel workshops will take place.

The conference has a range of aims:

- to overcome academic, professional and cultural gaps in a common quest for applicable knowledge;
- to identify workers' needs in order to counter negative effects and properly negotiate the new trends;
- to establish contacts and networks for fruitful future co-operation across national, academic and organisational boundaries;
- to identify vital research needs for the years to come.

The conference is open to researchers and experts specialising in occupational health issues and to union officials.

Papers and posters

What is SALTSA?

A unique initiative was taken two years ago, when the Swedish National Institute for Working Life and the three trade union confederations (LO, SACO and TCO) joined forces in a Joint Programme for Working Life Research in a European Perspective. The programme - usually referred to for convenience by its Swedish acronym "SALTSA" - was set up to initiate and fund research projects focussing on the labour market and employment, work organisation and work environment and health. Each of these fields is overseen by a joint committee. After the initial phase, results are now beginning to show.

The programme may be Swedish, but the projects are to be truly European in that researchers from different European countries are to be involved. The reason is simple: Sweden's membership of the European Union means that domestic conditions will be affected by EU policy-making, while Swedish interest groups will want to be involved in this process with solid arguments. Also, it is considered that scientifically-based results that benefit Swedish employees will advantage fellow employees in other countries as well. So concerted actions with co-funding from other sources are helpful. SALTSA can support a broad range of activities, such as empirical studies, reviews, seminars, networking and preparations for research programmes.

Three labour market trends entail a need for new or updated knowledge and new approaches to research on the health effects of the work environment, namely:

- internationalisation, migration and mobility;
- enforced flexibility in space, time and contractual arrangements;
- employability and the ageing population;
- harmonisation of standards in the EU.

To the SALTSA committee for environment and health, work environment means a lot more than machinery, chemicals and physical localities, although these aspects are far from disregarded. The activities undertaken and planned by the committee thus take a broad view of occupational health and safety as including work environment management and the needs of different categories of workers.

R&D activities already under way are:

- a scientific documentation of consensus-based European criteria for work-related upper limb disorders. A final report will be presented in November 1999;
- a European comparative study of the different models for implementation of the EU framework directive for work environment;
- an analysis of health and safety management in small enterprises;
- a comparative study of quality and effectiveness in different occupational health service systems in the EU;

During the conference *parallel workshops* will be arranged on three topics: road transportation, health and hospital work, and subcontracting in the motor vehicle industry. There will also be a *poster session* on the same topics.

Anyone interested in giving a workshop presentation or exhibiting informational posters should contact Anders Schaerström (SACO) or the TUTB.

The programme and practical information on the organization of the conference will be sent out in autumn 1999.
For further information, please contact:
• Anders Schærström, SACO Box 2206,
SE-103 15, Stockholm, Sweden.
• Dominique Schwan, TUTB,
Boulevard Emile Jacqmain 155, Brussels.

• a web forum supporting European researchers working with occupational safety and work environment management.

Planned research activities for next year will focus on:
• ageing, health and sustainable work ability;
• migration and work-related health. These activities will start by establishing a network of researchers and other experts;
• the health consequences of "The New Working Life", implying pronounced trends towards flexibilisation and casualisation in working life.

The committee's aim is for the project outcomes to lead on to practical measures and improved working conditions in Europe. ■

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TUTB ACTIVITIES IN BRIEF

10-14 February 1999 - Antwerp

The training course gave an overview of the key trends in European health and safety policies and the challenges posed by the design and use of work equipment, with a particular focus on the Machinery and Work Equipment Directives.

Participants from 15 European countries, including many in Central and Eastern Europe, split up into two working groups: one looked at the challenges of transposing and applying the two directives into their various national settings; the other considered their experiences with participation in the standardization process. ■

A more detailed report on this training course can be found in the minutes published on our web site:
http://www.etuc.org/tutb/en/afett.doc

Forthcoming TUTB activities

New AFETT/TUTB training course:

■ ***Musculoskeletal disorders***
The session aims to:
• evaluate the effects of technical and organisational changes on working conditions, with particular reference to new occupational illnesses and related disorders such as musculoskeletal disorders;
• identify the best ways of contributing to the awareness and mobilisation campaigns on the themes the European Trade Union Confederation has decided to support;
• reinforce the action of the Trade Union Technical Bureau for Health and Safety in making representations to the public authorities responsible for implementing the EU's health and safety directives.
Dates: to be decided.

■ ***Protection of the health and safety of women workers***
The session aims to reinforce women's involvement in occupational health and safety campaigns, focussing on their specific needs; to analyse progress made in this regard in various countries, with particular reference to the transposition of EU health and safety measures; to broaden the ETUC's action in support of women's rights concerning health and safety.
Dates: 24-28 October 1999.

Meeting of the TUTB network of chemicals experts
15 and 16 NOVEMBER,
ITUH Building, Brussels.

Meeting of the TUTB network of standardization experts
22 and 23 NOVEMBER,
ITUH Building, Brussels. ■

Cover illustration: Don't take the strain, GMB, UK

THE TUTB IS LOOKING FOR

Two working environment and technical standardization specialists:

ONE SPECIALIST IN WORK ERGONOMICS

ONE SPECIALIST IN THE DESIGN AND SAFETY OF MACHINERY

You have:

- a scientific or higher technical background;
- good knowledge of English (spoken and written) plus one of the TUTB's other working languages (French or German);
- experience in giving practical input into improving the working environment;
- an interest in the trade union approach to work environment issues.

You will:

- give expert input to Community work (European Commission, Luxembourg Advisory Committee, European Committee for Standardization, Bilbao Agency,...) on harmonizing working environment standards:
  - ergonomics, musculoskeletal disorders, psychosocial factors, stress,...
  - design and safety of machinery, technical standardization, risk assessment of work equipment;
- organize and coordinate the business of the network of trade union experts on standardization;
- write reports and articles;
- set up seminars and take part in conferences in different EU countries;
- take part in international training schemes.

Please send your letter of application, together with a CV and important publications to Marc Sapir, Director of the TUTB - Bd Emile Jacqmain, 155 - B-1210 Brussels ***before 30 November 1999***.

THE EUROPEAN TRADE UNION TECHNICAL BUREAU FOR HEALTH AND SAFETY was established in 1989 by the European Trade Union Confederation (ETUC). It provides support and expertise to ETUC and the Workers' Group of the Advisory Committee on Safety, Hygiene and Health Protection at work. The TUTB is an associate member of the European Committee for Standardization (CEN). It coordinates networks of trade union experts in the fields of standardization (safety of machinery) and chemicals (classification of hazardous substances and setting occupational exposure limits). It also represents the ETUC in various bodies concerned with certification and eco-labelling.

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