

1989-2009

**Twenty years of
the Machinery Directive**

**Twenty years of
union action to raise standards**

—

Frédéric Rey, journalist

with Clotilde de Gastines, journalist

etui.

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Preface

Getting trade unions admitted to the exclusive club of technical standards developers has been no easy job. But as early as the 1980s, it had emerged as a key part of a strategy for better working conditions.

Technical standardization is a fairly abstruse world for the non-specialist. There is a stark contrast between the way technical standards permeate every aspect of our daily lives and work, and the fact that these standards are drawn up by a small group of insiders through nigh-incomprehensible procedures. Worse: these standards are private property and cost a small fortune to buy. A company health and safety committee wanting to buy all the technical standards relating to all the items of work equipment used would face a pretty hefty bill.

Most of the players in technical standardization come from big business, and are apt to want to protect their own products, production and testing methods by drawing up benchmark standards that will give them a competitive advantage. Single semi-public national standards bodies are an established tradition in Europe, unlike the multiple bodies that operate in the United States.

Getting trade unions admitted to the exclusive club of technical standards developers has been no easy job. But as early as the 1980s, it had emerged as a key part of a strategy for better working conditions. As far back as 1985, the European Trade Union Confederation (ETUC) called for a tripartite European body to be set up to work out the essential safety requirements and check that standards were meeting them. No such European body ever came about, despite practical evidence from some countries that a scheme of this kind could significantly inform the workplace debates on technical standards. This brochure takes a special look at original tripartite body schemes such as KAN in Germany and Eurogip in France.

The 1989 Machinery Directive was to give added importance to technical standards. Henceforth, Community legislation would just lay down essential safety requirements, while technical standards would be the nuts-and-bolts refer-

ence documents that reflected them into the design of specific equipment. To some extent, technical standards have become a necessary supplement to the legislation, even though they are mostly produced by and only commercially circulated among private sector players. This is what prompted the ETUC to set up the Trade Union Technical Bureau (TUTB), which is now subsumed into the European Trade Union Institute (ETUI).

The past twenty years have seen a long road travelled, many difficulties arise, and a way of working developed. It is this collective and challenging background work that this brochure sets out to describe. So as not to descend into self-congratulation, we asked a journalist, Frédéric Rey, to spend a few weeks embedded in the networks we work with, and round off that hands-on experience with a series of interviews. He was ably assisted by Clotilde de Gastines. The field work was coordinated by ETUI researcher Stefano Boy, while the editorial aspects were handled by the ETUI's Communication Officer, Denis Grégoire. I have offered up a few final thoughts by way of conclusions.

— *Laurent Vogel*

Director of the Health and Safety Department, ETUI

From the workshop to CEN, arguing the workers' case

Even when known about, they may seem incomprehensible. And yet, the standards on machinery shape the daily lives of millions of people. These codified rules materially influence the safety and health of users who have every interest in working in an environment where equipment is not only safe but also as physically comfortable as possible to use. 2009 marks the twentieth anniversary of the Directive on the approximation of the laws of the Member States relating to machinery (Directive 89/392/EC of 14 June 1989, below called the “Machinery Directive”) which set two big objectives for standardization: promoting freedom of movement of machinery by removing existing obstacles, and ensuring workers’ health and safety.

The job of adopting standards was handed to European organizations, but the Directive does not say how it is to be done. Deciding what the standards should contain was left to equipment and machinery manufacturers, and to all civil society stakeholders – consumers’ associations, trade unions, and even members of the public – who wanted to put their case. Mindful of how much was at stake for workers and their health, the trade unions engaged with the process. This brochure looks at what trade unionists from Brussels and Rouen to Siena and Hamburg, often working very much in the background, are doing with teams of doctors, ergonomists, OSH experts and engineers to see that machinery design is not just about the financial bottom line, but also and especially the human one.

Work-proofing standards

Workers still get relatively little say in the debates on health and safety, particularly in regard to machinery and equipment used in work places, even though the

Machinery Directive specifically gives trade union representatives a hand in developing the technical standards that it makes centrally important.

The aim: to get changes made to Standard EN 1459¹ which deals with all the engineering data relating to telescopic lift trucks (or telehandlers). The trade union officials at a morning meeting in the CGT trade union offices in Rouen (Normandy) in February 2009 found this a less-than concrete, not to say unachievable, aim. How and where are these standards, some of which they had never even heard of, worked out? How can someone other than a manufacturer or technology specialist possibly get a standard changed?

The Machinery Directive specifically gives trade union representatives a hand in developing the technical standards that it makes centrally important.

For by far most trade unionists, machinery standards development is something wholly alien to what they do, a million miles away from their workplace concerns, especially in a downturn when safeguarding jobs again tops the list. And yet, standardization is central to work. Standards are written voluntary agreements that set rules

for products or services. Where machinery is concerned, their purpose is to lay down the technical specifications that professionals need to produce and put on the market equipment that complies with the requirements prescribed by the regulations.

Standards, little known, but hugely important

Standards have a big influence on the activities of workers who use machinery or work tools every day, because that equipment has to be safe enough to use. Standards that reflect only cost considerations can do harm: a design flaw or failure to take ergonomic requirements into account can result in injury, sickness, musculoskeletal disorders, even death.

The most recent study of the causes and circumstances of work accidents in the European Union (EU) shows that of 4 million work accidents resulting in more than 3 days off work in 2005 in the EU of Fifteen, no less than one million occurred in machinery-using occupations (farmers, workers in the extraction trade, metal and machinery trades, precision mechanics, the printing industry, plant and machine operators and assemblers)².

The Normandy meeting was about a project to collect information on how safe telescopic lift trucks were to use. Telehandler operators here, as in other regions of Europe, are well aware of the many failings of these machines. There is a European standard for this kind of lift truck, but it was developed by the manufacturers alone. There is a lack of logic about safety requirements being left entirely to the tender mercies of those who make and market the machines, given the conflict of interest that must arise between business dictates (selling at the most competitive price) and the need to comply with safety rules that are still largely viewed as an imposition.

Like most new machines put onto the market, lift trucks are CE-marked; but when put to the test of work, this is no guarantee that they necessarily fulfil all the relevant essential requirements. Visibility is a particular big problem and potential source of accidents. For example, a telehandler's telescopic boom can extend up to a height of 25 metres to pick up a pallet, but the operator has to lean out of the cab in order to see what he is doing and be

1. EN 1459:1998 Safety of industrial trucks – Self-propelled variable reach trucks.

2. *Causes and circumstances of accidents at work in the EU 2009*, European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities, p. 182.

able to precision-move the boom. This problem can be easily solved by fitting a videocamera outside and a control screen inside the cab. This solution is already available, but tends to be offered as an optional extra by manufacturers as if a camera were a luxury accessory when in fact it is an essential safety component. Another example is the side-view mirrors fitted to lift trucks which are often folded back as they actually obstruct the side view. The existing standard is riddled with failings and loopholes and in need of a complete overhaul. But getting there will take months or even years.

A New Approach

To understand the highly complex process of harmonized standards development, you have to go back to the very sources of European integration. The founding instrument of the European Community – the Treaty of Rome – provided that directives should be adopted to approximate the laws of Member States in order to promote the free movement of goods. The first result was a handful of very specific directives setting highly detailed technical requirements for a limited range of equipment.

Practical implementation of these directives soon ran into problems, not least that more legislation was needed to cover different items of equipment, and that the highly detailed technical requirements proved unable to accommodate fast-moving technological changes. The European Commission sought to address these issues by putting forward a

The central idea is to lay down general provisions applicable to sectors or product families, and types of risk.

New Approach to harmonization of the technical rules. This was approved on 7 May 1985 by a Resolution of the Council of Ministers, and put into practice by the 1989 Machinery Directive amongst others. The central idea is to lay down general provisions applicable to sectors or product families, and types of risk. That bypasses the drawn-out decision-making procedures of the past which

established technical harmonization through highly technical and detailed individual directives, product by product.

Under this new approach, directives no longer list the detailed technical characteristics that the machine must have. Harmonization is limited to essential requirements that products must have in order to be placed on the market and hence move freely within the European internal market. The Machinery Directive combines an economic objective – removing technical barriers to trade so as to enable free movement – with the social objective of ensuring a high level of protection for people through safety and health requirements, leaving it to business and the unions to work out the highly detailed technical specifications and instructions that the standards must contain.

The overall running of the process has been handed to two organizations: the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (Cenelec) (see p. 30). But what marks this New Approach out is that the standards development procedure is open to anyone, whether from the world of business or civil society. Theoretically, therefore, an ordinary individual or a small organization can have their say and bring about changes in their work.

"Evening-up the unequal positions for everyone to play their role"

– Interview with Ian Fraser

A former production manager in the paper industry, Ian Fraser became closely involved with workplace safety and risk prevention through his work in the French Ministry of Labour's working conditions department. In 2002, he moved to the European Commission's Enterprise and Industry DG where he is now responsible for machinery issues.

How do you think implementation of the Machinery Directive has turned out?

IF – The Directive really came into force in 1995 after a short transitional period. Fourteen years on, it is safe to say that most of the big families of machinery are now covered by harmonized standards. New standards are needed now and then, but most of the standardization work nowadays is about updating, because standards have to be re-examined every five years. By and large, the Directive has let safety be designed into machinery. I think that has helped cut the number of accidents caused by using work equipment or machinery. Particularly big strides have been made in the wood industry, for instance. The job of collecting information from users coordinated by the European Trade Union Institute has been a clear and welcome benefit. On the down side, farm machinery still presents big safety risks for operators. But overall, safety has gone up.

The standards development process has been opened up, but would you say that all points of view are getting a fair hearing?

IF – That is a problem, certainly. The process is theoretically open to all stakeholders. But giving that input means keeping up with what tends to be long and complex standardization work. It involves attending large numbers of national, European and even international meetings, for instance. You have to organize that work, and have the time and money for it, and this is where representatives of the big machinery manufacturers are obviously better-resourced than small and medium-size firms or workers' reps. The big manufacturers run the show and push on with or without the others. There is unfairness in the situation insofar as the end users have great difficulty putting their view across and influencing how the standards come out.

Does the process need rethinking?

IF – The problem isn't with the New Approach method as such, which I think is the best way of achieving harmonization. But standardization needs to move forward, in particular to take account of machinery users' views. The ETUI's varying successes have shown that information does not feed back of its own accord from the workplace. You have to go and hunt it out, organize it, then take it to the different national and European bodies. Where improvements could be made is in evening-up the unequal positions for everyone to play their role. But this is something the Member States have to do by allocating the necessary resources, especially to the trade unions to enable them to get more involved. Would regulation be a more effective way to go? I'm not sure you can say one system is more perfect than another. There's no bigger inherent risk in the process enabled by the New Approach.

Will the move towards developing international standards undermine this essential safety requirement?

IF – I think the way we in Europe must respond to this new challenge of internationalizing standards development is by being broadly receptive to international developments while sticking up for our established gains in health and safety protection. Agreements have been concluded between the International Organization for Standardization (ISO) and CEN (Vienna Agreement) and between the International Electrotechnical Commission and Cenelec (Dresden Agreement) to develop standards co-operatively in order to avoid duplication of work and adopt international and European standards that are identical. That means you can have an international standard that fulfils the requirements laid down for European directives, which is good for everyone concerned. There are some good, and some not so good, things. Most of the European and international general standards on the safety of machinery are now the same. On the down side, it is harder to get agreement on standards for particular categories of machinery. There is still no agreement on self-propelled trucks, for instance, because positions are too far apart.

Getting the workers' voice heard

The method used is based on joint regulation by the public authorities and private interests taking shared responsibility for rule-setting. Machine builders and machinery manufacturers took part from the start to promote their interests. But the unions also staked a claim in this work in progress. Right from being set up in 1989, the Trade Union Technical Bureau – the forerunner of the European Trade Union Institute's (ETUI) Health and Safety Department – set about helping European trade unionists to influence the development of machinery standards.

The unions can have a big influence in getting workers' first-hand experience taken into account. Who is better-fitted to get standards more focused on safety and welfare requirements than the employees who work with the machinery? Trade union participation was shown to be essential if views other than those of the producers were to get a hearing. Experts, engineers, and machinery designers tend not to have experience in operating the equipment concerned.

But how do you exert the influence needed to change a standard? The ETUI does it through a feedback method based on organizing the collection of information on the same type of machinery directly from groups of employees in several countries. The project on telescopic arm lifting trucks is being run in five countries, for instance – Italy, Germany, Finland, the United Kingdom and France through the Normandy initiative.

In Normandy, the project kicked off in February 2009, when a coordinator was appointed. In the weeks after, a group of six forklift truck drivers working in different firms had to be set up. The trade unionists are looking into what networks they can use to form the working group. A prevention specialist from the regional health insurance fund who was at

The aim is to compare the standard against what actual work tells us.

the meeting promised to contact safety-minded employers who might be able to put up volunteers to take part. The next step was to bring these employees together to talk about their daily work with lift trucks and the problems they encountered.

When the French, Italian, Finnish, British and German groups have finished collecting their information, the ETUI's standardization specialist, Stefano Boy, will collate and summarize all the data gathered. The aim is to compare the standard against what actual work tells us. Then, it will be a matter of taking the evidence to the national and European standardization bodies. Practical changes to standard EN 1459 are not around the corner, but that is another story...

Telescopic lift trucks: sizing up the German workshop

– Interview with Horst Leisering

As the French working group gets down to business, the German study is all wrapped up. The Hamburg working group leader Horst Leisering is a specialised building engineer who has been working since 1991 for the federal building workers occupational risks insurance fund (BG-BAU – *Berufsgenossenschaft der Bauwirtschaft*).

You ran the working group on telescopic lift trucks in November 2007. How did you go about getting ready for this workshop?

HL – I was running this working group on my own. I first looked for a work site that had several of these machines operating. I went around five work sites over summer 2007: the Itzehoe bridge on the Stör river, a railway tunnel in Schuby, an office building in St Peter Ording, a concert hall in Handewitt, and the new Altenwerder container terminal in the Port of Hamburg. I interviewed different people at all these sites, and that gave me insights into the main issues that the workshop was to look at. On four of these sites, operators were using a single lift truck. I eventually opted for the new Altenwerder container terminal which was using seven lift trucks! We worked with six operators. The seven lift trucks were new Italian-made Merlo machines.

How did the workshop go?

HL – We spent a day simulating their work processes step by step. The questionnaires look at all the movements the operator makes from entering to leaving the work-site, the division of tasks, choice of equipment, simulating the work done unloaded, loaded, in an enclosed space or in the open air, etc. Our discussions were informed by photographs and the use of a mini-lift truck to simulate the movements. Using the answers, we then filled in a step-by-step table to identify what might happen, pinpoint dangers and how to avoid them. We ended up with a four-column table listing the procedures, the abilities needed, possible hazards and suggestions for preventing accidents. These questions let us delve into the minutest detail, like wearing safety shoes, or even checking that the foot pedals on one machine are in the same order as on another.

How did the workshop go, and what about your proposals?

HL – The workshop went very well. I was a bit concerned about participants being over-enthusiastic and getting completely wrapped up in the discussions. Many of the proposals we made and the problems we found were already known about or even regulated by a standard. Some other things were not really connected with health and safety, but more about ergonomic needs. Also, our proposals overlapped with those of other workshops that had already been held. But everyone raised specific points, potentially worthwhile innovations. As to what the scheme will lead to, there's a big "but" there. We may have formulated proposals, but they still have to be discussed in the standards bodies. Machines have unquestionably got much safer over the past twenty years, but the unions lack the leverage and know-how needed to get their case over, especially as this kind of workshop needs doing with each type and make of machinery. And that's not easy to organize.

Any other problems with the process?

HL – The machines are built to specific standards laid down by CEN. These standards can be changed every five to ten years, but sometimes it takes longer. The ETUI might not have appreciated how drawn-out the process is, how long it takes for all the institutes to get down to work. Especially as volunteers are not always forthcoming in the other EU countries. We are probably not yet fully used to these consultations. What is certain on the other hand, is that it takes far too long for anything to be done about the proposals. The “feedback” idea is good; I’ve incorporated it in a more simplified form in the training courses I give for the BG-Beam. I would have liked KAN (German Commission for health and safety at work and standardization – Ed) to look at earth-moving machinery in a future workshop, but as it goes, the next consultation will be on combine harvesters. It’s an odd choice because German farms tend to be owner-run businesses, you don’t find that many unionized workers. That makes me a bit dubious about the relevance of the next project, at least within the German context.

“Standards shape the work environment”

– Interview with Marc Sapir

Marc Sapir’s science doctorate led him to continually explore the role and place of science in society all throughout his career. A trade union and voluntary community activist, he was first concerned with the earliest European standards on consumer goods. In 1989, supported by the European Trade Union Confederation (ETUC), he set up the Trade Union Technical Bureau which is now part of the ETUI. Marc Sapir looks back at the early days of standardization which was originally industry-inspired.

When did the first industrial standards come into being?

MS – Standards development was very much a function of the first industrial revolution and the growth of mass production. The expansion of trade made it increasingly necessary to create a common language and rules that were missing. For trade to develop, all these products had to abide by certain common rules; they had to be defined and standardized. So industry felt a need to rationalize its activity, which it did by adopting common standards. This is when the first standards bodies appeared in the big industrialized countries. They were originally set up by business, but soon turned into national agencies. Some of them are still real institutions today, like *British Standards* (BSI) in Great Britain, *Deutsches Institut für Normung* (DIN) in Germany and *L’Association française de normalisation* (AFNOR) in France.

How did European integration change things?

MS – Where standards are concerned, national cultural differences were seen as barriers to the free movement of goods. The introduction of the internal market in 1992 was another milestone that let European standardization clear national borders. Standardization became instrumental in the further harmonization of legislation and the development of intra-Community trade. In some areas – like machinery – the authorities laid down principles and objectives, and expressly provided that conformity to the standards raised a presumption of compliance with the law. In other words, where a

manufacturer claims that he has conformed to the standard's requirements, the burden of proving otherwise if he has not falls on the State. Also, the Machinery Directive has a combined economic aim – to achieve freedom of movement of products – and a social aim – to deliver a high level of safety for individuals. While big business was looking to create a huge single market, the unions saw things differently, and claimed a say in how standards are worked out and what goes into them.

What were the unions after at the time?

MS – You have to see this debate in the political context of the 1970s and 1980s. One thing trade union activists wanted was to make big changes to work. They had a highly critical take on work. There was also a wider societal debate on this need to think about and challenge new technologies, their impact on daily life and the risks they might have for society. Where company decisions on technology are mainly profit-driven, the unions focused on the human aspects. By acting at early stages of innovation – design, manufacture, application of techniques and processes – standards determine the social and environmental conditions of new equipment and machinery. To some extent, they shape the work environment. There was a clear need to engage with standardization so as not to leave experts and industry a free hand. So in 1989, the ETUC established the Trade Union Technical Bureau to pool and coordinate knowledge. The idea was to recruit experts, ergonomists and engineers who had workplace experience but were also activists alive to the social impacts of technologies. Right from the off, the Bureau's mission was to act as a facilitator between the scientific and technical community and the trade unions.

How did the trade union engagement with technologies develop?

MS – Economic and social circumstances changed. The era of full employment and high growth gave way to harsher economic times and long-term mass unemployment. Jobs came before work on every trade union agenda. As the new realities began to bite, the idea of transforming work got sidelined. Standardization was not always top of the list for the unions. Also, while the Machinery Directive successfully came up with a regulatory process, nothing was done to help the stakeholders take ownership of it and make it work. Standardization work takes time, money and access to knowledge. We try to persuade the EU States of the need to help the trade union participants because they cannot compete on a level playing field with the representatives of business who have a big say in the national standards bodies.

Many trade unionists still know little about this trade union involvement in European standards development. Why is that?

MS – Perversely, although the process is open to all stakeholders, it is almost entirely out of public view and deeply impenetrable. The end result is that users do not know the conditions in which the standard was framed. The discussions all go on in private, unlike the legislative process where all discussions are publicly-accessible. The other drawback is the consensus principle which is key to standards development. The stakeholders concerned have to reach consensus at national level first, and this is then taken up to the European level in CEN or Cenelec. But what exactly is meant by a “consensus”? Does it mean balanced representation of all interests? The system has its failings, but would the

legislative method work better? The current approach is certainly no magic bullet, but it does at least create an opportunity and process of negotiation that the workers can play into with a view to improving work. The main thing is to help the unions and workers to play their full role.

“Globalized” seats ignore different body shapes

A Dutch manufacturer of off-road truck seats had a new prototype tested by workers before going into series production. Twelve men and three women of different body sizes/shapes took part in the test. All of them drive big tonnage off-road trucks used for moving stones or earth in open-cut mines or on large road-building sites. Two specialists in physical stresses and ergonomics from the TNO, the Dutch institute for applied scientific research, plus the manufacturer's expert observed and quizzed the participants on actual driving sessions. Different types of seat were tested. Each operator drove sitting on each seat for a four-hour session, totalling twelve hours in all.

The study found that internationalizing and globalizing off-road truck production was encouraging products to be designed in a highly standardized form for a very wide user base, with too little account taken of differences in individuals' body sizes/shapes. Drivers found the design of the upper seatback, headrest and the longitudinal curvature of the seat caused them physical discomfort and fatigue. Smaller, slighter-framed drivers wearing safety headgear, for example, needed an easily adjustable headrest. Some adjustments were made, but not enough. Many suggested improvements had to be put on indefinite hold because they would have caused excessive hold-ups in vehicle production.

Humanising standards, a long painstaking job

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Ergonomists, occupational health doctors and social scientists have showed that work is a highly complex process, and more than just carrying out an instruction or prescribed task. Working can mean having to depart from and contravene the rules, and then not advertising the fact. Understanding work means shedding light on this hard-to-see part of it. But these are depths that have to be plumbed to get to grips with the risks that stem from the work environment. The ETUI fosters projects using what is known as a “feedback” method based on active participation by machinery users.

Italy, birthplace of the feedback method

The first organized attempts to feed back workers’ experience were made in Tuscany at the end of the 1990s, first in the wood industry, then extended to other types of machinery. The feedback method was developed by an engaged network of trade unionists, employers and OSH experts.

In the little town of Prato, north of Florence, Maurizio Callailo, the safety officer for the Luigi Ricceri spinning mill, proudly shows off his factory’s forklift trucks – handling equipment which this small firm with a workforce of 80 uses for loading and unloading the rolls of fabric. But these are different to standard forklifts in one particular: the safety belt has been replaced by an alternative operator restraint system – small safety gates fitted either side of the vehicle. The safety belt does the same job of protecting the operator in theory, but in daily practice operators continually had to get in and out of their cab, which meant forever having to fasten and unfasten their seat belt.

It was a repetitive movement that proved restrictive, and all the operators eventually ended up dispensing with the safety belt, running the risk of being crushed if the truck rolled over. But a safety system ensuring that the operator is kept in his cab to avoid being thrown out is essential. “When we started to look closely at these machines, we were short on information”, explains Giovanni Tognocchi, an engineer with the public work hazards prevention service and a specialist in forklift trucks. “But we had found big problems with machine stability, which was behind a number of accidents, some of them fatal. In the 1980s, Italy was averaging 1500 or so accidents a year including forty deaths directly related to the use of these vehicles.”

The reason why his mill’s lift trucks are fitted-out differently today is due in part to Maurizio himself who took part along with other experienced operators in a 2004 working group to analyse the work actually done with these machines. It is anything but a one-off in Italy, especially in the Tuscany region, which is the birthplace of the feedback method. The origins go back to 1997, when the Trade Union Technical Bureau (TUTB) – now part of the ETUI – commissioned SindNova, the Italian trade union institute set up by the *Confederazione Italiana Sindacati Lavoratori (CISL)* union, to come up with a way of informing design by workers’ experiences, pinpointing and preventing risks³.

Italy was no chance choice to be the testing ground for this kind of scheme. A series of health and safety at work surveys done among the Sienna region’s travertine marble quarry workers in the 1980s had shown the value of getting both engineers and workers involved in order to understand the real complexity of work. Another big consideration was the regions’ tradition of co-operation between operational staff, experts, public enforcement bodies, employers and unions. All were willing to engage with the proposed study, making it that much easier to put it all together, and increasing the chances of success.

Actual work vs. prescribed work

– Interview with Gilles Seitz, occupational health doctor in the public transport sector, Paris region

What is this “actual work” idea all about?

GS – Actual work can be defined as the operational behaviour and sequences that employees carry out. Let me give you the example of an aeronautics company where I saw welders using a single movement to assess whether they had done their job properly or not. They stuck their hand into the aircraft engine to check the weld. This simple movement let them assess how good the work was in a matter of seconds. It isn’t a movement taught in aircraft makers’ handbooks, it is something developed with time and experience. It’s what is called tradecraft, and is handed on from older to young workers. Broadly-speaking, work rarely happens the way the organization plans it. Between what it prescribes and what actually goes on, there is a gap that the employees fill by using their intelligence to deal with unforeseen circumstances. There is a sort of creativity in work.

3. Project and outcomes described in: Strambi, F, Stanzani, C, Bartalini, M, Cucini, M (eds) 2001, “Ergonomia e norme tecniche di sicurezza: il contributo degli utilizzatori – La sicurezza delle macchine per la lavorazione del legno”, *Sociologica del lavoro teorie e ricerche*, Milan, Franco Angeli & SindNova, 248 p.

So work is always different from what the organization specifies?

GS – In very many cases. You could describe working as coming up against what doesn't work, what goes contrary to what we can control by our know-how. We do differently to what was specified in order to deal with a situation that shouldn't happen and was not foreseen by the organization. Overcoming this setback demands a very heavy application of subjective experience. This inventiveness may not be readily discernible because it takes place in the personal, daily involvement with the task, is not reckoned with by firms and not recognized today. What is useful in this harmonized standards development approach is promoting the feedback of workers' experiences.

You're one of the organizers of the steering committee that links the French trade unions together on standardization issues. What are your plans?

GS – We'd like to take the work on lift trucks started in Normandy forwards and develop other projects. We plan to ask each French trade union confederation to pick a machine and its standard in a specific branch of industry or geographical sector to get other working groups going with the employees. What interests me, as an occupational health doctor and trade union activist, is to get the most wide-ranging possible factory-floor debate going on work. We have to be clear that standards alone will not fix all the problems, especially when a machine – however standard-compliant it is – is used in a form of work organization that makes it dangerous.

Survey in woodworking industry SMEs

The Sienna region was again the setting for this test-out scheme, this time in the Elsa valley. It was run by the local health unit (USL, *Unità sanitaria locale*)⁴ led by Dr Fabio Strambi, an occupational health doctor and ergonomist. USL officials are responsible for organizing health care provision in each region, have policing/enforcement powers and provide advice to employers on health and safety at work. Fabio Strambi's team chose to look at the woodworking industry, a sector with a poor health and safety record.

Rotary mechanisms, cutting and slicing blades, wheel gears... The machinery used in woodworking can cause accidents that most commonly result in crushed hands, severed fingers, amputation, even blindness. In 1998, the European wood and wood products industry recorded nearly 90 000 work accidents resulting in more than three days off work. The accident toll even rose by 5% over the period 1996-1998. The rise was significant in small companies employing fewer than 10 people. Unskilled workers are not the only ones affected – skilled workers, and machinery assemblers and fitters are also exposed to the same risks. In Italy, approximately 3600 accidents recorded in 1997 were caused by woodworking machinery. Over half of these were in Tuscany, where the wood industry provides employment for a large number of SMEs.

In Italy, approximately 3600 accidents recorded in 1997 were caused by woodworking machinery.

4. USLs (now ASLs) are the front line of public health provision in Italy. They usually operate within a municipality and have staff who specialize in workplace risk prevention.

The authors of this 1997 study on woodworking machinery both recommended changes to the organization of work in the workshops, and made practical recommendations for improvements to standards. One such was for the standard to require mechanisms to be fitted to prevent contact with the saw and ejection of the workpiece. But this initial scheme also helped to develop a methodology for taking workers' hands-on experience into account. This is the feedback method that was used for other projects on forklift trucks, telescopic arm lift trucks and angle grinders. "Just interviewing employees is not enough to understand work, otherwise a simple questionnaire would do. The method uses a series of rules that are essential to achieve the aim", says Fabio Strambi.

The feedback method unlocks the secret of work

The feedback method can be best explained by going back to the cases of woodworking machinery and lift trucks. In the preliminary phase, the USL team set about collecting all the local then national data on wood industry accidents. The enforcement authorities went into workplaces to record failings in the work stations concerned. Their investigations found circular saws and milling machines to be especially dangerous. The analysis of workplace accidents revealed a series of issues, including poorly-designed safety systems and operating procedures. The aim was also to get an understanding of all aspects of the machine by collecting all the technical and commercial facts and figures. "The working group convenor's credibility depends on having this knowledge", stresses Fabio Strambi.

Stage two is to set up working groups for a specific type of machine, comprised of four to nine users from different firms to allow for the wide range of situations in which the equipment is used. For telescopic arm lift trucks, the Italian groups brought together users working in construction, port handling and horticulture. "We had both employees and business owners/managers on them", explains Massimo Barbani, convenor of the working group on lift trucks in the Pistoia region, north of Florence, "because safety of machinery is a collective issue that concerns everyone. One of the group members was the boss of a small family nursery with just one employee."

Lift truck commissioning and control, moving under load, moving unloaded, unloading procedures, parking ... The work is carefully broken down into different specific phases. Each is carefully studied by the working group which lays down the operating procedure, knowledge base, risk factors and suggested accident prevention measures for each stage. "The worker-participants reconstruct the work by reference to their own experience, so we are in a situation of actual rather than prescribed work", Fabio Strambi comments. All the information is collected by the group convenor and summarized in a table.

A recognized method having a hard job making inroads

The feedback method has set a benchmark which is now used to good effect in various countries. But despite bringing about improvements in prevention, local schemes are still thin on the ground. "We need to ramp things up now to make the method standard practice," says the ETUC's Claudio Stanzani. "These schemes developed out of the proactive, strong commitment of engaged individuals convinced of the need to collect information that reflects what really goes on. It is an activist approach, but we now need to turn it into an institutionalized practice."

Its sponsors want a European social partner network to be set up where machinery users' actual experiences could be collected and put to use in improving protection. "This ability to build a network between all those in Europe who share knowledge of machinery and health and safety issues is vital to meet the challenge of participation in standardization", argues Marco Masi, Director of the Tuscany Region Health and Safety Department and a fervent believer in the feedback method. The ETUC's Claudio Stanzani believes that "this isn't just about throwing money at the problem; what it mainly needs is a political will; the funding will follow".

Design flaws and organisational factors cause an accident

Three employees were injured in an accident which occurred during routine maintenance on a flour milling machine. The initial inspection found that safety procedures had been followed and the equipment was not faulty. At issue was a machinery design problem. The plant was owned by a French milling group employing 160 workers. The employer decided to take the investigations forward through the combined efforts of different players: company executives, specialized employee health and safety reps, plus health and safety inspectorate and regional health insurance fund officials. The

employee reps on the health and safety committee, workers and supervisory staff helped to reconstruct the facts to create a problem diagram of the causes of the accident.

The participatory approach was based on interviews with the operators and their proposals for improvements to the machinery design. The collective investigation showed that the design of the temperature monitor needed looking at again. But the analysis also revealed that the accident happened when shifts were short-handed and identified hitherto unrealised training issues. The approach was instrumental in a Ministry of Labour-run process being set up to detect and identify failings in safety standards.

ETUI – a helping hand for unions and workers

– Interview with Stefano Boy

Stefano Boy was first employed for several years as an oil refinery operator after graduating as a nuclear safety engineer. He went on to work in the European Commission's Research DG, analysing industrial accidents and hazards in Seveso major accident risk plants. He joined the ETUI in 2000. Here, he talks about his involvement in machinery standards development.

You're the ETUI's specialist in standardization matters.

What exactly does that involve?

SB – We support trade unions to help them interface between two worlds that have no other points of contact: that of experts, machinery designers and that of users, i.e., workers. The first thing we have to do is give trade unionists from the different European Union countries an understanding of standardization, because it is so important. For that, we set up a network of trade unionists in Europe. But it isn't always easy to find people in the different countries who are ready to be regularly involved in the network's activities. Its members try to meet up at least once a year. And that annual gathering is an important opportunity to get trade union knowledge from the national confederations that the ETUI can use to frame its strategy for getting a bigger trade union say

in standards development. Along with this, the ETUI coordinates the running of feedback projects in various countries to improve the quality of particular machinery design standards.

Is funding a big concern for the project teams?

SB – It is a core concern that trade unionists regularly bring up. To have an influence on the European standardization process, you have to attend a lot of meetings. The trade unions need people and money to pay for travel and subsistence. Without funding, you can't put this participatory approach into practice. To do its work properly, the working group needs a convenor, a secretary to take notes and write up reports. In some countries, like Sweden, Germany, the United Kingdom and France, subsidies can be found, but running networks calls for a lot of energy. The dream situation is Sweden, where the State has allocated a significant annual amount that means a number of European standards can be monitored.

Why might the unions want to influence standards?

SB – For a variety of reasons. It may be to point up failings in an existing standard, to take a line on a standard in the works, to call for a new standard for a machine of particular concern to them, like machinery with a particularly bad accident record, or in connection with the five-yearly revision of existing standards.

How can trade unions play into the development of standards?

SB – The case of telescopic arm lift trucks makes the importance of highlighting workers' direct experience with a machine clear to see. But once the data has all been collected, the next stage is no less important – informing and arguing the case to CEN, Cenelec and the national standards bodies. This means national action by the unions,

Safe concrete mixers

Building workers use concrete mixers to make up mortar. The machine operator charges it with sand and cement while it is running. It is charged via a circular aperture covered by a guard screen. When the job is done or after prolonged breaks in operation, the guard screen always has to be opened to hose out the drum and hand-clean the paddles.

Originally, the guard screen had to be firmly affixed with screws so that it could only be opened by the use of tools as required by the Machinery Directive. But this was completely impractical for users, as the guard screen is not easy to open using tools, especially when it has to be done several times a day. Gradually, the workers started leaving the guard screen open, so the drum could be cleaned more easily. But

this entailed a high risk of accidents, because operators could insert their hand into the rotating drum to clean it. Manufacturers and construction companies in the Württemberg region in Germany decided to look for a solution that workers would not see as making their job more difficult.

It was decided to replace the screw-on guard with cut-out switches that would bring the concrete mixer to an immediate stop if the guard screen was opened and ensure it did not restart as long as the guard screen remained open. This solution was carried into the draft standard on conveying, spraying and placing machines for concrete and mortar with a requirement that where cover guards are opened one or more times a day, it must be ensured that the mixer is stopped by an emergency stop control and prevented from restarting while the guard screen is open.

backed up at European level. Fortunately, the unions can take advantage of tools developed by specialized bodies. Eurogip in France is a case in point. It has developed a highly useful database – Normabase – which can be used to search for a draft standard, an expert’s contact details, or the work of a technical committee. This has made Eurogip a system of choice for trade union participation in standardization work. KAN, the German Commission for health and safety at work and standardization, works in the same way, collecting information on standardization work for prevention professionals, making it available and disseminating it in particular through the NoRA standards search database.

How does this double linkage set-up work?

SB – The thing is that CEN and Cenelec mainly consist of representatives of the national standards bodies. The ETUI has been an associate member of CEN for over fifteen years. CEN and Cenelec have set up forty-odd technical committees that produce the standards. Take the technical committee that keeps the lift truck standard under review, for example. It comprises representatives from each national standards body. Running alongside this at national level, each standards body has a “twin” technical committee also dealing with lift trucks. Our insider-speak for these is “mirror technical committees”, and they have an important role in the process. Each national standards body can only vote on the basis of a uniform national position in CEN, so it is very important for the trade unions to be present at national technical committee meetings. Action needs to be taken on the national and European fronts at the same time. Unfortunately, users’ experiences and wants are very often ignored quite simply because no trade union rep went to the national meetings, which does not help matters.

Where does the ETUI come into this process?

SB – We aren’t in the national technical committees, but we do take part in CEN and Cenelec meetings. But if our case hasn’t previously been argued by trade unionists at their national meetings, we go into CEN in a weakened position and all the work done to consolidate the data collected from workers and get the standard changed can go for nothing. The problem is that the procedure is still dominated by manufacturers’ organizations who have the human and financial resources needed to send their representatives to every meeting.

Don’t the trade unions have to have a say in these different official bodies?

SB – The trade unions are invited to take part, but you have to appreciate that this is not about policy, but technical expertise. To have credibility as a legitimate participant, you have to speak the technical language, and meetings are all in English. And you have to abide by certain codes and rules. That is what makes the ETUI so crucial, because that is our business, so we can give trade unionists the best support possible.

Trade unions and standard-makers talking to one another: the German model

Prevention professionals listen to users before drafting a standard, but users' interests are not always reflected in the final versions. New processes are in hand in Germany.

Ulrich Bamberg represents white collar unions to the German health and safety at work and standardization body, KAN. He has been keeping a close watch on the recent European draft standards that take machinery users' views into account. "User input is standard operating procedure for the KAN. As an industrial sociologist and work sociologist, it's a working method I set great store by", explains Ulrich Bamberg. "Especially given my very particular position as the trade union liaison for the commission. This is very much a German thing."

The lack of democracy in standards development was taken into account when KAN was founded. Manufacturers normally dominate standardization. They tend to look at risks from their own viewpoint, when those who use their products are better fitted to assess the hazards. KAN acts as a kind of forum, where government, work-related risk insurance funds, employers and workers' requirements are all brought into play. KAN's job is both to monitor (and criticise) standards in force, and help to frame new standards. Worker participation was minimal until recent years, but has since increased greatly, especially where machinery is concerned.

"User input is standard operating procedure for KAN", Ulrich Bamberg

Trade union complaints

In practice, Ulrich Bamberg supports workers' reps in standards development meetings. He provides training, advises works councils and employers on specific health and safety problems. Employees sometimes bring specific issues to him, like a recent phone-caller who told him, "You ought to look into chain saws. Theoretically, you can use them one-handed, even though they're pretty hefty pieces of kit. You need to be able to hold them with both hands so your other hand doesn't risk coming into the cutting area. Is there anything you can do?"

KAN is now building a new case for the standards bodies to take account of the views of machinery users, consumers' associations and trade unions. Collecting their practical experiences is relatively cheap to do. Setting up Internet forums should make sure that everyone gets their say. When a standard has to be reworked, the trade unions and work-related risk insurance funds make their experts available. "Their expertise is key", says Ulrich Bamberg. "We work with both industrial and service sector unions. The industry unions traditionally have more experience, which makes exchanges easier. We also work with sickness insurance funds, like BG-Bau for the building trades, in the case of telehandlers."

Pinpointing the risks

KAN has been involved in many projects to consult machinery users on different kinds of machinery (woodworking machines and telescopic arm lift trucks), coordinated by the ETUI at European level. A new project on agricultural machinery got under way in April 2009 involving five countries: Denmark, Germany, Great Britain, Italy and Sweden. KAN will be studying combine harvesters. Users will be canvassed by the farmers' sickness insurance fund for central and eastern Germany, which covers six Länder.

BG-Bau: when will insurance and prevention have a decisive say in standard development?

Focus on a construction industry *Berufsgenossenschaft*

The work-related risk insurance funds for many sectors sit on the standards bodies. BG-Bau is a work-related risk insurance fund exclusively for building, civil engineering and allied services workers in Germany. 2.8 million workers employed in nearly 300 000 firms are insured with it. All construction firms must insure their employees with BG-Bau – there is no other alternative. The work-related risk insurance funds are jointly run by employers' and trade union representatives for their industry.

The Federal government has given it two jobs: to manage the sickness and accident insurance coverage of these workers, and provide prevention provision. BG-Bau experts must be trained civil engineers with proven, relevant workplace experience.

The experts have a threefold advisory, policing and training role. In 2007, the number of accident investigations fell to just below 3000, while participation

in training days also dipped slightly, averaging around 50 000 a year. BG-Bau's standardization involvement is part of its advisory duty. It has extensive experience from being in daily contact with those who work in the building industry.

"Our daily work keeps us well-informed about industrial accidents", explains expert Horst Leisering. "Manufacturers cannot claim to be as close as we are to those concerned. We have to stay neutral in the standards bodies, steer a middle course between the employers and employees' interests to promote health and safety."

Andreas Heiland of BG-Bau goes further: "I have only ever been to one standardization committee meeting, and there was no trade union representative at it. The manufacturers and a handful of federal health and safety at work representatives and representatives of the work-related risk insurance funds (BG) were sitting together in no particular order. Most of the time, there will be about 10 to 12 manufacturers for a single BG representative, or two at best. Try and put your case over in those conditions, it's a waste of time and effort!"

The idea is that the surveys collect users' criticisms and comments. Machine tool manufacturers have a lack of information on how their machinery is being used, as well as the design flaws and failings. Not all a machine's risks are direct. A lift truck windshield may freeze in winter, the rear view mirrors may mist up, and the hot-air blower may not demist them. "These are all glaring faults that the machinery designer should have spotted", complains Ulrich Bamberg. Mobile plant operators cannot always see somebody moving into the blind spot, and can run over them or send them flying. "Where this method wins out is in being preventive", emphasises Bamberg. "We look at design flaws and malfunctions of the machine before an accident happens. Is the first step up to the cab too high? Constantly getting in and out to load and unload goods is tiring for operators, which increases the risks of falls, etc. The brake, clutch and accelerator pedals are not laid out in the same way as in a car, and a mix-up can be fatal."

"Where this method wins out is in being preventive",
Ulrich Bamberg

Users for and against

This feedback method has proved its worth. Calling attention to a machine's flaws can help produce a use or manufacturing standard that can be made generally applicable Europe-wide after a protracted process. A preparatory questionnaire is drawn up on the machine before the working group is set up.

It is about identifying the stages of work processes. When is my machine ready to use? Can I switch it off, put it on standby, does it run unloaded? What job can I do with this

machine, what are the risks to the user, people around him? What could be improved in how the machine is designed – horns, rear view mirrors, mirrors, cameras? It has to be admitted that not all the users canvassed always take it seriously, leaving Ulrich Bamberg having to argue the case for this participatory approach. “Some experienced users think they know how to handle a machine well enough. Obviously, I can understand their unwillingness to take our advice seriously. KAN would occasionally like to have more feedback. We will get there – prevention isn’t yet standard operating procedure.”

Prevention professionals propose a standard

After a fatal accident, KAN pushed to get the standard changed.
How things got to where they are

All machines have a lifespan, they age and seize up. Sometimes, the user protection systems are not up to the job. Channel baling presses are a case in point. They operate 24/7, constantly being charged with textile and paper waste by an array of conveyors. The press chambers are complex installations that often jam. “An employee recently got caught up in the machine”, says Ulrich Bamberg. “He was working alone at night, when the machine jammed. He left the control station to remove the obstruction. The press suddenly un-jammed itself, he lost his balance, and was crushed with the rest. There was nothing to stop the machine. No emergency stop control, or life line to grab hold of.”

There turned out to be no standard for using this machine. Following this accident, KAN set a procedure going in CEN jointly with a sickness insurance fund to get work started on developing a standard. “We put in a draft with the registration form, which prepares the future standard”, explains Ulrich Bamberg. “The more detailed your demands are, the better chance you have of shaping the final version.” The procedure will now run its course. The CEN steering committees have to endorse the demand. If sufficient bodies are not interested, the procedure will fall through. KAN can still choose to press on with it on a national basis, and will notify CEN so that another EU country does not end up duplicating the work. The outcomes can then always be put back to CEN at a future date.

A group of European OSH experts have drafted a proposed standard that would increase the safety of this type of machinery. They are now looking for support to get a draft standard launched at European level to give practical effect to the Machinery Directive’s essential safety requirements and help make these machines safer to use. An initial proposal for a standard was drawn up out by the sickness insurance funds’ sectoral committee on materials handling and warehousing technology. French, British and German prevention professionals have revised the proposal in recent months.

Focus on mechanical risks

Working on the basis of a risk analysis, the OSH experts put forward a proposal for a standard formulating the safety requirements that baling presses must meet. As is usual in European machinery safety standards, they first considered the different types of risk, then defined requirements that were apt to minimize them, focusing particularly on mechanical hazards. The main thing is to prevent people from inadvertently accessing the interior of the machine, especially the press area.

The proposed standard lays down fundamental requirements to prevent breakdowns, to preclude the operator from accessing the danger area, as far as possible. It also describes safety devices to protect persons who nevertheless have to enter and work in a danger area: if operating or maintenance personnel require access, for instance, all hazardous movements must first be automatically stopped.

The next stage will be for KAN to apply for a standardization project to DIN, the German standards body, submitting the text drafted by the prevention professionals as a proposed standard. If DIN approves the application, it will be forwarded to CEN. CEN will poll its members – the national standards bodies – to determine whether they support such a standard and are willing to become actively involved in drafting it. A majority of CEN’s currently 30 members must approve the application for the standard to proceed. Furthermore, at least five members

A majority of CEN’s currently 30 members must approve the application for the standard to proceed.

must declare their willingness to become actively involved in the European committee’s work. According to CEN, no technical committee currently exists for drafting a standard on channel baling presses. If the application is approved, a special project group will probably be set up and mandated for the job.

The stakeholders are now called upon to become involved. OSH experts, operators and manufacturers who are interested in baling presses being standardized at European level should contact their national standards organization. The objective is to ensure that the outcome of the CEN survey is positive, and thereby to support the application for standardization. The best means by which the content of the standard can be influenced is of course that of active participation on the CEN committee. “This opportunity is open to you if you have yourself appointed as a national expert by your standards organization. You can however also contribute your experience at national level in the mirror committee. Take this opportunity and contribute to the creation of a European standard for baling presses which defines a uniform safety standard and thus makes an effective contribution to preventing accidents”, KAN scientific adviser Dr. Michael Thierbach counsels stakeholders⁵.

Clothing industry: more effective finger guards

In the United Kingdom, a designer clothing manufacturer and the GMB trade union joined forces on a project to improve the design of the finger guards that sewing machines have to be fitted with in order to avoid needle-in-finger injuries to machinists who are trying to unjam the thread on a jammed machine. The problem is that there is a space in traditional metal guards into which the machinist’s finger can inadvertently slip, risking an accident that may be serious enough to require surgery. A working group of two trade union safety reps, an en-

gineer, supervisor and workers was set up in one of the company’s workplaces with a poor accident record.

The users came up with proposals for specific improvements. Within six months, a prototype design was produced that enabled efficient working, good needle visibility in operation, and easy access for threading. The new finger guard design reduced the level of injuries. The British standard for sewing machines dating from 1918 was revised. With the union’s help, changes were also made to the European standard. The manufacturing company viewed the project as a success for communication and cooperation.

5. “Channel baling presses: safety requires a standard”, *KANBrief*, 03/08.

Concluding thoughts

The best way to get a general flavour of trade union participation in European standardization activities is to look back at the early beginnings. The interview with Marc Sapir recalls the trade union debates that raged during the 1970s, when many union activists with a wide range of backgrounds and often different ideological outlooks put workers' control of technological developments on the agenda.

The unions felt that any introduction of new technologies had to be discussed by employers and workers first. Daily practice had shown that negotiating measures to support workers after unilaterally imposed changes made by employers was both frustrating and ineffective. This demand for a more equal say in technology decisions struck a chord in wider society. The labour and student unrest of 1968 and after saw a growing number of students, scientists and technicians looking at the use of science and technology through more critical eyes.

A European Trade Union Confederation conference held in Paris in May 1983, emphasised that, "If the only consequences of new workplace technologies are to be increasing unemployment by doing away with jobs, forcing working conditions down in order to make costly investments pay, then the answer will be a resounding no. If, on the other hand, the new technologies serve the whole workforce, if their use prevents men and women in firms and services having to do painful and dangerous work, if their introduction allows the existing volume of work to be shared out between all those who have a right to a job, then the answer will be an equally resounding yes."⁶

But showing the need for a debate in the world of work was not enough – there had to be some way of informing it. In other words, opposing knowledge and assessment criteria had to be brought to bear if the discussion was not to be restricted to just the consequences of particular techniques. That meant taking the division of labour in society to task and especially calling time on the specious distinction

6. Unofficial translation

between designers as the fount of knowledge and workers as mere operatives – fallacies that actually legitimate usurping workers’ knowledge and effectively turning it against them to exploit them further.

The trade unions’ entry into standards development was therefore but a small and limited part of a much greater plan. The 1980s brought a shift in the centre of gravity of attempts to promote workers’ control of technological developments. The focus on working conditions and the social inequalities that characterize them lessened. The big challenge to businesses’ absolute right to make technological choices was a growing awareness of the ecological disaster being brought about by our model of production. A critical trade union focus on working conditions, increasingly in alliance with environmental groups, was a big step forward.

The continuing big issue, however, is that there is only any point to institutional participation in or connected to the standards bodies if it contributes an independent view. The idea is not for the unions to compete with the legions of engineers put up by the big producers, but to argue for a method and criteria that bring the demands of immediate productivity up against those of protection of health at work. Our action has been focused on promoting the knowledge that workers have of their own job, on the idea that listening to workers’ experience adds new knowledge on top of what other forms of expertise bring. It also argues that the health, safety and well-being of workers are at least as important benchmarks as direct productive efficiency. We wanted this knowledge not to be taken over for business production purposes but rather applied to improve working conditions.

Twenty years on, and notwithstanding the many difficulties encountered, the picture is on balance positive. But daunting challenges remain: how to introduce a balancing influence into the standardization process? How to break the current near-monopoly of industry groups? The makings of a reply that we have managed to put together are based on the enthusiastic and creative collaboration of dozens of trade union activists from different countries across Europe.

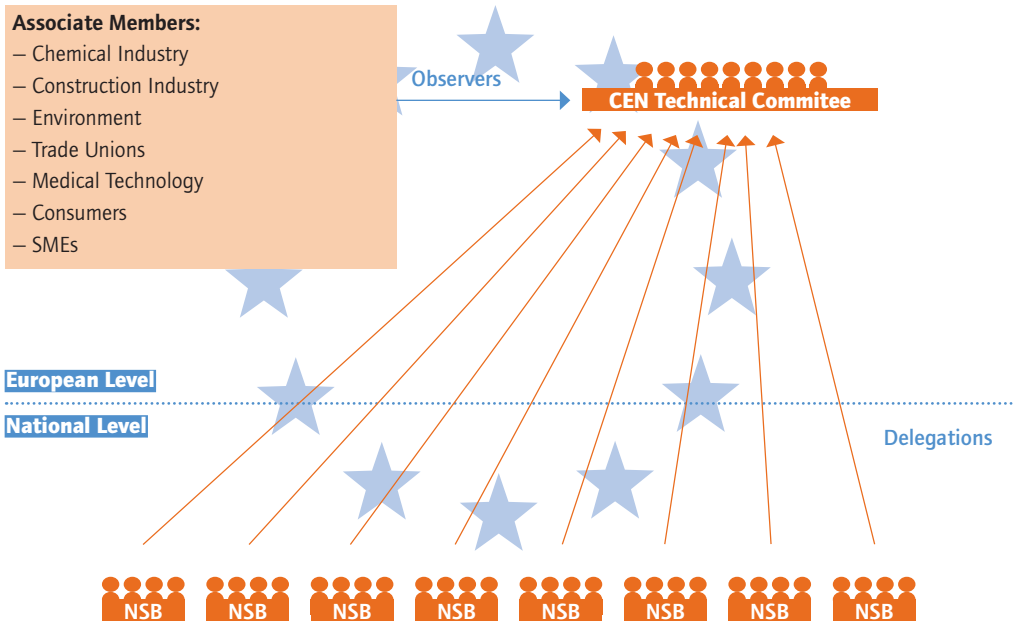
Hopefully, this brochure will help to inspire even more trade unions to join forces with those of us working towards that end.

– *Laurent Vogel*

Annexes

Who's Who in standardization

- **The European Committee for Standardization (CEN)** was established in 1961 to harmonize European standards. It is based in Brussels, and was set up by the different standards organizations of the member countries of the European Community.
- **The European Committee for Electrotechnical Standardization (Cenelec)** was created in 1973. Likewise based in Brussels, the organization draws up standards related to electricity, electronics and associated technologies. In 2007, CEN and Cenelec decided to link up. The agreement led to the setting up of a working group to optimise the use of standards production resources.
- **The national standards bodies** are DIN in Germany, BSI in the United Kingdom, AFNOR in France, SIS in Sweden, NBN in Belgium, AENOR in Spain, UNI in Italy, etc. They are key players in standards development.
- **The European Commission** mandates CEN and Cenelec to produce the harmonized standards. It provides funding for their secretariats and can finance special groups to take part in standardization work to give a voice to different interests, like trade unions, consumers, environmentalists, small and medium-size firms, etc.
- **The Member States** can challenge an existing standard or draft standard on grounds that it is not compliant with the Machinery Directive's requirements. This will happen where national inspection body investigations reveal a high recurring accident rate involving a machine. Anyone living in the European Union can put their views to their



NSB (National Standards Body) :
 Public Authorities – Academia – NGOs (including trade unions) – Industry – Trade Federations

government. The Commission receives around a dozen challenges a year from the Member States to the 600 existing standards.

The tortuous journey of a harmonized standard!

A standard has to go through many stages from when a new work item is initiated to when the final version is published. The procedure between the starting and finishing lines is in the hands of a working group tasked with developing a standard in conjunction with different national and European bodies. And it takes several years to complete. The trade unions do not need to be involved in the entire process unless they really want to. The whole thing is to know at which key stage the workers' reps' case needs to be made.

1. **Deciding the work item:** proposals to develop a new standard can be submitted by anyone concerned with the machine in question. In most cases, proposals will originate with the mirror committee of a national standards body. Existing standards are subject to revision every five years.
2. **Getting it adopted by the European standardization committees and the Commission:** the work item must be validated by the relevant European Committee for Standardization (CEN/Cenelec) technical committee, then included in a work programme. The new work item is then adopted by the Commission.
3. **Setting up the working group:** the CEN/Cenelec technical committee sets up a working group and appoints a convenor who asks the national standards bodies to appoint experts to take part in the working group. The work can then start in earnest.
4. **Interaction between the working group and national standards bodies:** after several meetings, which may spread out over a year, the working group members produce what they feel is a finalised document. They consult the national standards bodies on it and attempt to incorporate the comments they make. A draft standard is then proposed.
5. **The CEN/CENELEC enquiry:** the CEN/Cenelec technical committee now meets and decides to put out the draft standard to the six month enquiry. It sends the draft to all the national standards bodies for all those concerned to give their views on its relevance as a standard and make detailed comments on its contents. Meanwhile, a consultant draws up a report on the draft standard's compliance with the Machinery Directive.
6. **Examination by the consultant:** the standard is examined by the CEN/Cenelec consultant who draws up a detailed report on the standard's compliance with the Machinery Directive. That report is sent to the working group.
7. **The final draft:** once the enquiry is completed, the comments are collated and sent together with the consultant's report to the working group to be gone through. Meetings are held at which the comments collected during the enquiry are rejected or accepted by the working group. A final draft is sent to the CEN/Cenelec technical committee.

- 8. Voting:** there are three stages to voting: the pre-formal vote, formal vote and post-formal vote during which adjustments can still be made. Once the standard has got through the formal vote, the national standards bodies can formally object to it being published on the grounds of serious health and safety risks. If the objection is upheld, the standard is sent back to the CEN/Cenelec technical committee for modification and a second formal vote. The standard is ratified by the CEN/Cenelec Central Secretariat and sent to the national standards bodies to be translated and published.
- 9. Publication in the *Official Journal*:** the standard is sent to the Commission to be published as a harmonized standard in the *Official Journal of the European Union*.
- 10. Final examination:** there is still no certainty at this stage that the standard will come into effect because the Commission's Machinery Directive Group of Member State representatives and observers of interested organizations can examine the standard if a Member State issues reservations about its contents. It can call for a published standard to be withdrawn or modified on the grounds of non-compliance with the Directive. The recommendations are forwarded to CEN/Cenelec with a request for the standard to be modified. In practice, the standard will then be revised.

A short primer on the Machinery Directive

Three types of standard

A large body of European standards has been developed under the Machinery Directive. There are currently over 800 standards common to all the Member States of the European Union.

The experts have assigned standards to three different categories:

- **Type-A standards:** these are horizontal standards that apply to all machinery for which they lay down a basic methodology for designing safe machines. For example: standard EN ISO 12100-1/2 – Safety of machinery, basic concepts, general principles for design;
- **Type-B standards:** dealing with safety devices and techniques that can be applied to all machines if need be. Approximately 120 standards of this category have been developed. Examples include standard EN 953:1997 “Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards”; standard EN 349:1993 “Safety of machinery – Minimum gaps to avoid crushing of parts of the human body”;
- **Type-C standards:** a body of approximately 700 standards dealing with specific machinery or specific groups of machinery. They are intended to create a presumption of conformity with the essential safety and health requirements covered by the standard. For example: standard EN 930 “Footwear, leather and imitation leather goods manufacturing machines – Roughing, scouring, polishing and trimming machines”.

The scope of the Directive

What is a machine?

The Directive defines a machine as “an assembly of linked parts or components at least one of which moves, with the appropriate actuators, control and power circuits, etc.; joined

together for a specific application, in particular for the processing, treatment, moving or packaging of a material”.

The definition contains four key elements:

- “**an assembly of parts**”: broadly-speaking, the Directive (apart from in the specific cases cited below) is concerned not with individual components or sub-assemblies, but with equipment;
- “**the parts must be linked**”: for machinery sold in kit form, the handbook must contain the assembly instructions;
- “**one of the parts must move**”: this is clearly the defining characteristic of a machine within the meaning of the Directive. This means that mechanical structures containing no moving parts (scaffolding, shelving, etc.) are excluded;
- “**for a specific application**”: once installed, the machine must be fitted for its function.

This final point is important, because it defines the equipment concerned by the use to which it is put. For example, an electric motor is an assembly of linked parts at least one of which moves; but it falls outside the Directive. Once fitted together with other components, however, it creates an assembly (compressor, current generator, etc.) and that is what falls within the Directive. By contrast, an outboard motor is ready to use because the end user simply has to affix it to the boat.

In short, any equipment that has a mechanism (moving part) and a specific application may be a machine within the meaning of the Directive regardless of the type of end user (professional/non-professional use). The scope is therefore much wider than what might commonly be understood by a “machine” (lathe, milling machine, press, etc.).

An assembly of machines arranged so as to function as an integral whole is treated as a machine.

Exclusions from the Directive

The Directive excludes manually-operated machinery (hand-operated guillotines, non-powered pallet trucks) other than lifting appliances (manually-operated hoists). But a machine that is powered by stored manual effort (in springs, by gravity or pressure) falls within it. The operator’s control of the movement may be a relevant criterion: does the movement stop if the operator stops what he is doing?

The Directive also applies to “interchangeable equipment” (accessories assembled by the operator with a machine to modify its function – e.g., a tractor-mounted lifting device), “safety components” placed on the market separately to fulfil a safety function, the failure of which would endanger the health or safety of exposed persons, and various other components like load lifting and stowing accessories, or transmission shafts and their guards.

Two certification options

The manufacturer is the person who assumes responsibility for the design and manufacture of a product covered by the Directive for the purpose of placing it on the Community market under his own name. Failing that, it may be any person who places the machine on the market and assumes full responsibility for conformity. Before placing machinery on the market, the machine manufacturer or his authorized representative established in

the Community carries out a conformity assessment procedure. The CE mark is not in any sense a quality mark issued by a specific authority or approved body: it is the visible sign by which the manufacturer indicates that the machine complies with the Directive's applicable requirements. The manufacturer can affix the CE mark at whichever place on the machine he wishes, so long as it is visible. In most cases, it is affixed on the name-plate.

The CE mark on a machine is meant to indicate that someone has taken responsibility for certifying that the Directive has been complied with. In fact, it requires compliance with all the directives that may be relevant to the equipment, like those on electromagnetic compatibility, pressure equipment, use in a potentially explosive atmosphere or electricity supply, for example.

There are two ways by which a machine can be put on the market:

1. Self-certification

This is the usual way, the manufacturer must have:

- designed and built his machine in accordance with the essential safety requirements including how the instruction handbook is written;
- draw up the technical file;
- draw up the EC declaration of conformity;
- affix the CE marking.

There is no requirement to use a third party service.

2. EC type-examination

This procedure is for special cases only. As for self-certification, the manufacturer must satisfy the essential safety requirements and draw up technical documentation but before he can sign his declaration of conformity, he must call upon a notified body to assess its conformity. The manufacturer chooses a notified body for his type of machine; but he needs only use one, and it needs not be one in his country.

The term "EC type-examination" in fact covers three procedures which the manufacturer can choose from depending on whether or not he has complied with the specific harmonized standards:

- option one: the notified body simply acknowledges receipt of the file without examining it;
- option two: the notified body checks that the standards have been properly applied and supplies the manufacturer with a certificate of adequacy for the technical file;
- option three: if the harmonized standards have not been complied with, the notified body carries out an EC type-examination of a model of the machine and the technical file and supplies the manufacturer with an EC type-examination certificate.

The machines for which an EC type-examination is required are listed in Annex IV of the Directive (woodworking machines, presses, etc.). Only machines that meet the definitions listed in this Annex are concerned.

The presumption of conformity

The Machinery Directive's reference back to standards makes standardization a key factor in harmonizing the technical aspects of safety. The European-level standards bodies are CEN and Cenelec.

Standards are there to lay down the voluntary technical specifications that professionals may meet in order to produce and place compliant products on the market. The New Approach widened the circle of stakeholders eligible to take part in standardization work to include designers, users, representatives of the public authorities or trade unions, safety experts, etc.

The essential characteristics of harmonized standards are:

- the mandate by which the Commission requests the standards bodies to put forward a harmonized standard;
- the technical specifications required to design and place on the market products that fulfil the safety requirements of the Directive;
- publication in the *Official Journal of the European Union* – this is essential for the standard to confer a presumption of conformity. Moreover, the European standard must have been transposed into a national standard in at least one Member State.

Standards are by nature voluntary; only regulations have binding force. Standards are just one of different ways of achieving the desired end. Applying a harmonized standard does not relieve the manufacturer from carrying out a risk analysis. The Machinery Directive requires each Member State to enact legislation or regulations that apply in each Member State, rather than just copying the Directive over word for word. But these national statutes and regulations are organized differently to fit in with the different legal systems. This makes an understanding of the Directive – as the “source document” – useful.

Relationships to the essential health and safety requirements of other New Approach directives

The Machinery Directive provides that where an identified risk or danger is already dealt with in another Directive, the requirements of that specific Directive are the means that must be used to meet the essential safety and health requirements of the Machinery Directive. Take the example of a risk or danger associated with a potentially explosive atmosphere: the Directive on equipment and protective systems intended for use in potentially explosive atmospheres (Directive 94/9/EC, known as the ATEX Directive) will probably apply to such risks. This makes it essential for the list of risks and dangers identified for a given machine to be checked against the list of New Approach directives when any harmonized standard is being drafted.

Relationships to other directives

Machines are multi-purpose and adaptable, so they may be governed by directives that deal with other matters, like noise, for example. To claim the CE mark, therefore, a designer may well have to show that his machine fulfils technical requirements like those limiting noise emissions. Also, some health and safety at work directives require designers to meet specific technical requirements, like fitting a roll-over protection system to certain vehicles before they can be put into service.

Documentation that must come with the machine

Each machine is always associated to a set of three key documents: an EC declaration of conformity, an instruction handbook and a technical file. The first two are supplied with the machine itself to the buyer.

The declaration of conformity contains vital information for the customer, not least the manufacturer's identifying particulars.

Each machine must come with an **instruction handbook** containing information that allows commissioning, use, maintenance, handling, installation, assembly, dismantling, adjustment, and other operations to be done safely. The handbook also contains training instructions, the characteristics of tools which may be fitted to the machinery, and ways in which the machinery should not be used. It must be written in one of the Community languages and accompanied by a translation into the language of the country in which the machinery is to be used, barring special cases (e.g., where maintenance is provided by the manufacturer or his authorized representative).

The technical file contains information that enables the design steps taken in the manufacturing process to be retraced. It must describe the means of protection used, but contains only the essential safety requirements. It must be written in one of the official languages of the European Community. The technical file allows the manufacturer to prove that he has made the right choices. The description of the means of protection may be a useful defence in discussions with the inspection authorities but also a selling proposition. It may be very difficult to claim good faith without properly structured and substantiated documents. The problem is that workers do not get to see the technical file, which is only available to the national authorities responsible for implementing the Machinery Directive.