

'Under the clock': trade union responses to computerised control in US and Australian grocery warehousing

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In contrast to optimistic interpretations of contemporary work reorganisation, the example of computerised work monitoring in US and Australian grocery warehousing highlights a far more negative picture of work intensification, job stress and low trust relations. Despite significant variation in trade union response, the article argues such examples reinforce the need for strong and independent trade union regulation to limit the worst excesses of workplace rationalisation.

The workplace implications of new computerised technologies and job redesign has been the subject of significant debate. Despite critiques of the potential control implications of such technologies[1], an alternative and far more optimistic interpretation of new workplace technologies has developed, based upon increasing employee involvement and 'high trust' employment relations. Examples of such a view have varied from post-Fordist visions of socio-technical work reorganisation, to the recent advocacy for 'high involvement' or 'best practice' models of workplace governance which emphasise increased trust and commitment between employers and employees[2].

What role trade unions should play in this process has at best appeared ambiguous. Human resource management and some elements of post-Fordist writing for example see little necessary role for trade unionism in the 'new' participatory workplace[3]. In contrast, other writers have argued that current attempts at work reorganisation and the introduction of new workplace technologies provide unions with new opportunities for improving the quality of working life in areas such as training and employee participation[4]. Here it is argued, a shift towards 'cooperative accommodation' between unions and management is possible given the increasing common interest brought about by new production concepts[5]. Trade unions under this scenario become 'social partners' with management, both striving to improve enterprise performance. As critics point out, such a view also may result in a moderation of demands, a weakened role for rank and

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file mobilisation, an increasing enterprise focus, and a rejection of industrial action[6].

However, advocacy for greater trade union moderation and accommodation to issues of work organisation has been shaped by a fairly limited conception of the nature of contemporary workplace change. Based upon developments in manufacturing, and the auto industry in particular, work reorganisation has been equated to issues of team-working, 'self-Taylorisation', quality management and other participatory shopfloor practices[7]. Despite the vigorous debate that has evolved over the implications of 'lean production' technologies in car manufacturing[8], there has been a neglect of the broader range of contemporary workplace rationalisation. While many writers have stressed the emancipatory and skill-enhancing potential of workplace computerisation, where these technologies provide employers with the opportunity for much closer control over the labour process and significant cost savings, authoritarian or 'low trust' approaches to employment are just, if not more, likely to predominate[9]. The nature of trade union response to such repressive work regimes has been largely ignored, despite the fact that a strong, independent and well-organised trade union is essential in such situations if members' wages, job security and working conditions are to be protected.

Grocery warehousing provides a good example of the international spread of a 'low trust' workplace technology and the problems facing trade unions in responding to this threat. First developed in the United States during the later 1970s, 'engineered work standards' are a computer-based system of performance monitoring enabling warehouse managers to maintain 'real-time' control over each warehouse worker at the push of a computer-key. Within the last decade, North American consultants have spread these techniques worldwide and grocery warehousing companies across the globe have embraced computer-based performance monitoring as a means of maximising labour application and minimising labour cost[10].

Following a brief description of the context of grocery warehousing and the nature of computerised control, the article critically examines trade union responses to this technology in the United States and Australia. In contrast to the international convergence of management practice in this industry, the response of North American and Australian

trade unions to engineered standards has varied significantly from acquiescence to militancy, to attempts at rigorous collective workplace regulation. In contrast to optimistic interpretations of trade union moderation and partnership, the article argues that a combination of union militancy and regulation offer the best hope of protecting warehouse workers from the worst excesses of computerised control. Far from being an isolated example, the case of grocery warehousing has, we believe, important implications for labour movements worldwide in terms of how best to respond to instances of repressive workplace control. In addition, such global industry models of workplace rationalisation highlight the need for much greater international collaboration between industry unions.

Grocery warehousing and the drive for computerised control

While the supermarket and convenience store represent the 'public face' of grocery retailing, the work involved in keeping these outlets stocked with produce is far less well known and rarely observed. Grocery warehouses (or distribution centres) act as a critical intermediary step between the producer and the supermarket shelf, providing a means of storing and re-organising a vast range of products prior to their distribution to geographically dispersed retail outlets.

Despite significant industry concentration, grocery warehousing is a highly competitive industry based around regional product markets. Unlike other forms of warehousing, which often rely upon automated storage and retrieval systems, grocery warehouses in most cases continue to rely upon manual labour in the *re-assembly* of stock prior to its distribution to the retail outlet. This is achieved through the employment of order selectors, who drive powered pallet-movers around the aisles of the warehouse and manually 'pick' cartons of goods, building a pallet of stock to the order specifications, prior to its transportation by truck to the customer. Grocery warehousing companies compete vigorously for customers (retail outlets such as supermarket chains and convenience stores) in terms of the cost of their services, as well as their reliability, on-time delivery, and order accuracy. Profit margins in the industry are low, as a result warehouses must rely upon both tight cost control and the rapid turnover

of high volumes of stock in order to maximise profits and expand their customer base[11]. Originating in the United States, warehouse companies have responded to these pressures by attempting to gain greater control over warehouse inventory and operations through the development of computerised warehouse management systems[12]. In terms of employee management, these systems have resulted in a form of 'computerised Taylorism', in which each individual employee's performance can be closely monitored and tightly enforced.

Computerised warehouse control

Computerised control of the warehouse involves several basic elements. First, a 'real-time' inventory database is developed on the warehouse's computer network. Through the use of bar-scanning technology and a subdivision of the warehouse into grid co-ordinates, a continuously up-dated register of current stock levels can be maintained and individual products can be assigned their own unique storage location within the warehouse.

A second related element of computerised control involves the linking of inventory to the processing of customer orders. As soon as an order is received from a customer via modem, available stock can be checked, the order organised into the most efficient 'travel-path' for the order selector, and a list of printed adhesive product labels produced that detail the employee's picking order, the quantity of stock required and its location. The addition of radio-frequency direct communication within the warehouse, allows fork-lift trucks (involved in replenishing stock) to be linked to the computer network. Not only can fork-lift operators be cued when to deliver additional product to a particular location, but the location of fork-lifts can be tracked in real-time, thereby reducing the amount of idle time experienced waiting for orders and improving fork-lift productivity[13].

Building upon the computerisation of warehouse inventory and order dispatch, a third further element of computerised control involves the development of what are known as 'engineered work standards' and a work monitoring and enforcement system. First developed in the United States industry during the late 1970s, in the ensuing years this system of labour control has become stan-

dard practice throughout the North American industry and in recent years spread internationally[14]. Engineered work standards involve the generation of standard times for each individual job assignment. Through the use of traditional work measurement techniques such as stopwatch time studies and predetermined motion time systems, a library of standard times for basic warehouse tasks (for example, selecting a case, walking from one slot to another, travelling with or without a load from one aisle to another) can be stored in yet another computer database. Warehouse workers now 'clock in' each order by typing or scanning in their employee identification number and the order number. This initialises the order database, which stores the employee number and the actual time the employee picks up their order. When the employee returns to the order desk to pick up their next order, the moment the next order number is punched in, the 'clock' stops, and the software program calculates the elapsed time on the just-completed order. This elapsed time is stored in the order database together with the employee's identification number and the time allowed to select that order. From this data, a performance score is generated for each assignment. Such a data collection system means that at any time a supervisor or manager on the computer network can call up 'real-time' statistics for any employee's performance.

Once the real-time monitoring system has been established, not only will supervisors and other network users have access to individual performance statistics, but weekly efficiency reports can also be generated. These reports then form the basis for various forms of disciplinary action for those employees who fall below a predetermined weekly performance level. In the United States industry, such disciplinary procedures vary widely. Typically, the first offence prompts a verbal warning, followed by a written warning for the second, some time off without pay for the third and termination after the fourth occurrence. Various forms of 'retraining' might also be used to encourage greater work effort from under-performing employees[15]. Some grocery warehouses have also introduced wage incentive schemes as a means of encouraging employee performance over and above the new effort norms established under the engineered standards system[16].

Implications for warehouse workers

Available studies of the workplace impact of these systems suggest a variety of negative implications for employees. A key factor here is the significant increase in the pace of work that accompanies the introduction of the engineered standards system. For example, in two Australian dry grocery warehouses, expected work rates for order selectors increased by 35% to 75% a year after the introduction of engineered standards. Similarly one recent US arbitration decision found an average 30% increase in employee performance in one warehouse following the introduction of engineered standards[17].

Such increases in the pace of work can have a critical impact on employee health and safety. Manual warehouse work such as order selection requires a high degree of physical effort and is accompanied by a high risk of lower back and other lifting injuries. Increases in the frequency of lifting are likely to exacerbate such risks[18]. For example, two recent studies of grocery warehouses operating engineered standards systems by the United States National Institute for Occupational Safety and Health (NIOSH) found the work of order selectors to be physiologically demanding and at a level which many workers would not be capable of sustaining over long periods[19]. Workplace injury and illness amongst order selectors in the two warehouses was also found to be high, with back injuries being particularly pronounced (order selectors in these two warehouses had virtually a three in ten chance of experiencing a back injury involving medical treatment and/or lost time in any given year). As one NIOSH report concluded:

... the job of order selector at this work site will place even a highly selected workforce at substantial risk of developing low back injuries. *Moreover, in general, we believe that the existing performance standards encourage and contribute to these excessive levels of exertion*[20].

In addition, for many warehouse employees the operation of engineered standards is perceived as an all-encompassing form of managerial surveillance. Many employees speak of the feeling of being 'under the clock' from the moment they enter the warehouse to the moment they leave. Such attitudes are shaped by the system's 'feedback' mechanisms; an employee's performance score appears on the screen as the next order

assignment is typed in. As one forklift operator stated:

... with that RF unit on my forklift, I've got to let that run me all day. It tells me where to go and where not to go and it runs by time. If I don't worry about it and don't run to standard, I get in the shit so then that worries me. You're always worrying about it. That's what I was saying there. It's always in the back of your mind[21].

Disciplinary codes and incentive schemes reinforce the perception of surveillance over individual performance. Beyond the formal systems of discipline and incentive noted earlier, supervisors in many instances apply a range of informal 'carrots and sticks' upon the warehouse workforce. These measures might range from limiting the allocation of overtime or more favourable work assignments to employees considered 'good performers', to the use of close supervision and intimidatory methods reviews of workers deemed to be under-performing[22]. For casual employees, the incentive to attain standard is even greater, given that their continued daily employment is dependent upon attaining and/or exceeding standard performance[23].

Such close performance monitoring results in a psychologically stressful work environment. Responding to questionnaires in the two NIOSH studies, warehouse workers were asked to rate the demands of their job and their degree of job control. In both warehouses, order selection was characterised as a high demand, low control job suggesting a high level of psychological stress and decreased job satisfaction[24].

US and Australian trade union responses: acquiescence, resistance and regulation

Within both the North American and Australian grocery warehousing industries, management's use of engineered standards has followed a remarkably similar path, including identical technology and consultants. By contrast, the reaction of organised labour to such a 'low trust' management strategy has varied significantly. In interpreting the reaction of trade unions to technological change, traditional industrial relations studies have stressed factors such as the nature of the technological change (particularly its impact on jobs and worker skills), as well as union structure (craft versus industrial coverage) as

key determinants[25]. More recent comparative work has emphasised the role of differing national systems of collective bargaining and labour law in effecting union response[26]. In the US and Australian warehousing industries, differences in labour law between the two countries, as well as variations in union ideology have underpinned the divergence of trade union response. Three reactions are identified; acquiescence, resistance and regulation[27]. It is important to note, that these approaches are far from mutually exclusive, nor should they be seen as sequential stages in the development of trade union response to this technology.

Acquiescence to management control: the 'wait and see' approach

Prior to the introduction of engineered standards within both the United States and Australian grocery warehouse industries, employee work effort was defined broadly around the concept of a 'fair day's work for a fair day's pay'. In practice, many warehouses operated informal 'pick rates', which roughly measured the number of cartons 'picked' by an order selector per day against historical averages. However, these pick-rates were largely advisory and relatively few workers were disciplined for failing to attain the daily pick-rate target[28].

Within the North American industry, the transition from 'pick-rates' to engineered standards some fifteen to twenty years ago went largely unnoticed by the Warehouse Division of the International Brotherhood of Teamsters (the largest union representing warehouse workers)[29]. Many employers kept the development of engineered standards 'under wraps' to lessen the possibility of worker resistance. Indeed, in many cases the standards were 'turned on' without the Union even being made aware of the changes. Employers often refused to provide union officials with information about how the standards were derived[30]. An alternative approach was the provision by some employers of elaborate presentations about the new system. Invariably, though, these were aimed more at selling the system than explaining it. Generally, Teamsters' locals accepted the new standards on a trial basis with little overt opposition. It was not until union members began to be disciplined for failing to attain the new standards, that the

Union responded (albeit belatedly). This lack of response early on, provided employers with a significant head-start in the rationalisation of warehouse operations.

In Australia, the introduction of engineered standards has been a far more recent phenomenon and in the majority of states has been accepted with minimal resistance by organised labour. Traditionally, Australian unions have relied upon arbitral and legislative measures in seeking to regulate technological change and direct bargaining with management over the nature of work reorganisation has been rare[31]. Such acceptance has also occurred against a broader background of union commitments to productivity improvement and wage restraint, institutionalised at a national level for much of the 1980s and early 1990s in the 'Accord' between the Australian Council of Trade Unions and the Federal Labor Government[32].

The introduction of engineered standards in Australia began in 1989, when Coles Supermarkets employed American consultants to introduce a time-study based system of computerised work monitoring in its warehouse operations. The moderate Shop Distributive and Allied Employees' Association which held coverage of the Company's Victorian and South Australian warehouses, accepted the new system in return for a general pay rise and the introduction of a related wage incentive scheme[33]. A similar pattern of union acceptance was later replicated by the Queensland and Western Australian branches of the Union, as well as the Victorian branch of the National Union of Workers which also covers warehouse workers in that state[34].

While the decision to implement engineered standards represented a *fait accompli* in many Australian warehouses, some employers went to great lengths to 'sell' the system to union officials and employees. In some cases, briefings with union officials were held in which consultants outlined the details of the engineered standards systems, the monetary benefits for employees from participating in wage incentive schemes, the 'objective' nature of performance measurement, and how such systems conformed to 'international best practice'[35]. In most cases, union officials accepted management's right to introduce such systems as long as they were consulted about such changes and the systems complied with prevailing occu-

pational health and safety laws. In these states, union acceptance of engineered standards was formalised in separate enterprise agreements, usually in return for a general wage increase and the proviso that union officials be able to assess the fairness of the system from time to time[36].

However, such acceptance of engineered standards on trust placed both employees and their unions at a strategic disadvantage. As has been highlighted, the potential for work intensification and deteriorating workplace health and safety are ever present dangers. While standards may appear benign when first introduced, there is no guarantee this will always be the case. As a result, union acceptance of these systems on management's terms has, we believe, ultimately been a flawed approach.

Resistance to management control: confrontation and militancy

In contrast to examples of union acceptance, there have also been several notable cases of organised labour resistance to engineered standards within both the United States and Australia.

Within the North American industry, the realisation that engineered standards resulted in significant increases in work effort (often backed by punitive sanctions) led to a variety of forms of protest. An example of rank and file protest occurred in 1984, following the introduction of engineered standards and a related five-step disciplinary procedure at Certified Grocers of Illinois. With an arbitration hearing pending, workers began picketing the employers' downtown Chicago headquarters following the dismissal of twenty-four employees for failing to meet the Company's new performance standards. Although an 'informational' picket which attracted considerable media attention, the unofficial nature of the action and the fact that it breached the no-strike clause of the collective agreement resulted in the union ending the picket. The National Labor Relations Board later ruled that the employer did not violate the law by threatening disciplinary action. The pickets were returned to their jobs and the parties entered into a settlement agreement which accepted the productivity standards at face value[37]. While there were a number of other work stoppages reported throughout the early 1980s in response to the introduction of engineered

standards[38], in general legal prohibition of strike action during the term of a collective agreement has limited American union opposition to the arena of formalised grievance arbitration[39].

Given the legal limitations upon direct action within the US setting, an initial strategy amongst Teamster locals was to challenge the reasonableness of the standards themselves, as opposed to instances of individual discipline. The forum for these challenges was third-party arbitration, the Union arguing that the standards breached the collective contracts' provision of a 'fair day's pay for a fair day's work'. However, the Union faced an uphill battle in challenging the reasonableness of the standards under the fair day's work contract language. Under the American grievance-arbitration system, the burden of proof falls on the union when the union claims a contract language violation. Matters were not helped by the extreme complexity of the engineered standards system and the sheer weight of industrial engineering consultant expertise which employers could call upon. Not surprisingly, such union challenges were generally unsuccessful, despite the Union's use of expert evidence challenging the industrial engineering principles of such systems[40].

However, grievance arbitration did constrain employer action to some degree. For example, Teamster locals that arbitrated individual cases of disciplinary action flowing from engineered standards often succeeded where their more general challenges had failed. In cases of disciplinary action, the burden of proof shifts to the employer, and a number of issues are considered in relation to the facts of the case in determining whether the employers' actions were fair and reasonable[41]. For example, in a grievance arbitration brought against Orville Products, employees 'were disciplined strictly by the numbers' for failing to reach the standards. No inquiry had been made by the employer into extenuating factors or explanations, nor had the employees received any instruction as to how they might meet the production standards. The arbitrator therefore upheld the grievance in the Union's favour[42].

Moreover, both private arbitration and appeal courts have ruled against the right of an employer to unilaterally impose a warehouse standards system and then discipline employees for not performing under that system, without first *bargaining* with the relevant

trade union[43]. American labour law also requires that incentive payment plans must also be negotiated with the relevant union in good faith[44]. Such decisions therefore provide an avenue for warehouse unions to negotiate the details of how engineered standard systems will be implemented—an area explored in more detail in the following section.

In contrast to such legalistic challenges, a more direct form of resistance to engineered standards has been evident in one section of the Australian industry, through the actions of the New South Wales branch of the National Union of Workers (NUW). Traditionally a much more militant and active trade union than its other state counterparts, the New South Wales branch of the NUW has steadfastly rejected employer attempts to introduce engineered standards in grocery warehouses, viewing such systems as an attack upon working conditions and harmful to its members' health and safety[45].

Such a strategy began in 1989 with a two-week strike at the NSW warehouse of Retail Distribution Management, in opposition to Company attempts to time-study warehouse workers. In contrast to the SDA's acceptance of these systems in other states, the NUW's industrial action resulted in the Company curtailing its investigations[46]. During the early 1990s, a weakening of union workplace organisation following defeats in several major industrial disputes, led to the successful introduction of engineered standards in the state's two largest grocery distribution centres, Woolstar and Davids Holdings. Further violent and well-publicised disputes during 1994 led to the intervention of the state Minister for Industrial Relations and the establishment of an Industrial Commission Inquiry into the effects of engineered standards upon the health, safety and welfare of warehouse workers[47]. The establishment of the Inquiry resulted in the postponement by employers of attempts to broaden the use of engineered standards in other grocery warehouses. While the Inquiry's final report supported the employers' right to use engineered standards subject to increased consultation with employees and union officials, at the time of writing, a stand-off still exists between the Union and employers over this issue[48]. It remains to be seen what form such consultation will take, or indeed, whether union militancy and rank and file opposition will be sufficient to curtail the

wider use of engineered standards throughout NSW. Further industrial action has resulted in the prosecution of the Union for breach of strike injunctions, and the possibility of deregistration or significant monetary fines. Recent changes to federal labour law may also allow warehouse employers to further weaken workplace union organisation through the use of non-union individual employment contracts[49].

Regulating management control: bargaining and codes of practice

A third and more recent approach in the trade union response to engineered standards has been the attempt by unions to regulate the introduction and implementation of such systems through collective bargaining and codes of practice. Such a strategy challenges the notion that the operation of engineered standards should be solely an area of managerial prerogative. At the time of writing this approach has been limited to the United States industry. The lack of detailed collective union regulation in Australia reflects not only the relative newness of engineered standards, but also as noted earlier, the lack of a collective bargaining tradition over technological change amongst Australian unions and the tendency of the traditionally judicially arbitrated settlements to avoid placing limits on the prerogative of management to introduce new technology.

Given that engineered standards is now viewed in American labour law as an area requiring collective bargaining, the Teamsters union has in recent years begun to develop specific programmes and expertise in order to come to grips with the collective bargaining, occupational health and safety, and monitoring of engineered standards systems. Understanding that it could no longer rely upon the ad hoc assistance of academics in arbitration cases or industrial engineers to perform occasional studies of warehouses operating engineered standards, the Teamsters Union has in recent years established its own 'in-house' industrial engineering training programme. In combination with the University of Wisconsin's School for Workers, the Union has introduced training for union officers in both how to monitor engineered standards and also improve warehouse ergonomics. This programme allows union locals throughout the United States and Canada to arrange for specialist union engineers

to conduct on-site time studies and evaluations of engineered standards in their particular warehouses. These union 'audits', as they have come to be called, not only involve stopwatch time studies of warehouse workers in order to assess the fairness of employer standards, but also a detailed review of company documentation and productivity statistics. Such union industrial engineers are also available to testify as expert witnesses in arbitration cases. A spin-off of the development of internal union expertise in this highly complex area has been the increased success of union arbitration challenges to cases of employee discipline and the reasonableness of standards[50].

Another avenue of regulation adopted by the Teamsters' Union is the development of 'model' contract language with regard to engineered standards. Key areas here have included provisions for member and union access to standards information; employer-provided training of employees and union representatives; adequate notice of any proposed changes in work methods; minimum safeguards concerning personal, fatigue and unavoidable delay allowances; limitations on enforcement levels and modes of discipline; as well as minimum levels of rest breaks according to varying climatic conditions. The Union has been successful in many locations in negotiating for the inclusion of these provisions in collective contracts. Such model contract language has also been shared with other industry unions such as the United Food and Commercial Workers and the International Longshoreman's and Warehouseman's Union.

A third prong to the regulation approach has been evident in the Teamsters' aggressive pursuit of an occupational safety and health programme which takes account of the implications of the engineered standards system. Practical initiatives in this area have included union attempts to involve federal and state government agencies (as demonstrated in the two NIOSH studies noted earlier), as well as the dissemination of a wealth of training and informational materials to the membership in its Warehouse Division[51]. The recommendations from both NIOSH reports have served to buttress many of the issues raised in the recommended contract language, and have also assisted federal and state safety enforcement personnel in inspecting grocery warehouses. For example in several recent citations of grocery warehouses for breaches

of health and safety standards, settlement agreements have included employer commitments to ergonomic redesign of the warehouse, greater employee training in safe lifting techniques, and regular reporting of health and safety indicators to state regulators and union representatives[52].

Conclusion: management control and the potential for trade union intervention

As this case study has demonstrated, the spread of new computerised workplace technologies raise fundamental challenges for trade unions. Even though product market competition in grocery warehousing is primarily local or regional, the development of new computerised technologies, and their international dissemination via management consultants highlight the trend towards a global industry model of workplace control. Once the necessary computer infrastructure begins to develop in each country, so individual grocery warehousing companies become increasingly susceptible to the lure of labour cost-cutting promised by the engineered standards system.

By contrast, trade unions representing warehouse workers have few, if any, global instrumentalities with which to confront this technology. Unlike the more optimistic interpretations of workplace change and new technology that dominate the literature, the example of engineered standards raises a complex series of issues ranging from the increased potential for workplace injury and work intensification, as well as physiological and psychological worker 'burnout'. When first confronted by these changes, most trade unions lack the technical competency and are often not sufficiently prepared to deal with such a situation. As we have argued, the reactions of trade unions and their members hinge significantly on the prevailing system of protective legislation and labour law, the structure of collective bargaining, as well as the nature of union structure, ideology and bargaining power. The mix of these factors to a large extent determines the nature of labour's response, which as shown can vary across a spectrum from acceptance and acquiescence, to militancy and resistance, and in some cases, active regulation.

The perils of acquiescence are self-evident. Accepting engineered standards on manage-

ment's terms ignores the serious workplace implications that derive from a system based upon the 'speed-up' of a physically arduous work process. Once engineered standards are installed, they are extremely difficult to remove given significant employer investments in capital, time and credibility. Trade unions cannot afford to accept such systems on trust, but rather need to intervene at the earliest opportunity to regulate how such systems will operate.

Militancy and resistance can in certain contexts raise the costs to employers of continuing to operate engineered standards. Such a union strategy is dependent upon strong rank and file solidarity and support for industrial action and is only tenable where the prevailing system of labour law does not explicitly outlaw or limit such action. As was demonstrated in the North American industry, stoppages and strike action in opposition to engineered standards have been significantly limited by a labour law regime which prohibits industrial action during the life of a collective agreement. However, as the New South Wales case highlights, even within more sympathetic environments, continued shopfloor resistance cannot necessarily carry the day in the face of determined employer opposition. While resistance and opposition are logical initial strategies, in an environment of declining union bargaining power, even militant trade unions may be forced into a position of adjustment and accommodation.

Regulation represents a third avenue for trade unions responding to repressive workplace technologies such as engineered standards. Two variants can be identified. First, existing laws and regulations in areas such as occupational health and safety, industrial relations, and privacy might be used by trade unions as a means of limiting the worst excesses of engineered standards systems. While the tide of public policy in many countries has shifted aggressively toward greater deregulation, there are international examples of laws which would significantly limit a system such as engineered standards[53].

Failing the existence of available government regulation, the second avenue for trade unions seeking to regulate engineered standards involves collective bargaining. Ideally, such bargaining would occur at an industry level, involving all warehouse industry employers as well as consultants and aiming to establish an industry-wide code to stan-

dardise practice and eliminate the worst excesses of monitoring and enforcement[54]. In reality such industry level bargaining, in the North American and Australian examples at least, will be limited by the regional nature of the industry raising jurisdictional issues of union representation, as well as stiff employer resistance at attempts to constrain what they perceive as a highly productive form of workplace management.

Lacking industry-wide bargaining structures and the requisite power to enter into industry-wide bargaining, warehouse unions are left with enterprise-level attempts at regulation, as is presently the case in the United States and Australia. This is the least favoured form of regulation given its piecemeal nature. Unions must wait for enterprise agreements or contracts to expire before codes of practice can be negotiated and must be able to use industrial action to enforce their demands for such a code. The result is likely to be highly variable, reflecting differences in workplace union organisation, as well as the ability of non-union employers to avoid regulation altogether (as is increasingly apparent in the United States industry).

Finally, irrespective of the form of regulation, the global nature of this technology also means that trade unions need to develop global responses. At a minimum, this requires greater information sharing between warehouse unions in different countries about their experiences with computerised control and their attempts at regulating such systems. Initial steps have begun in this direction between North American and Australian unions, however much remains to be done. One practical scenario would be to establish an international clearing-house of information on engineered standards, which would allow warehouse unions from any country to access research, union training manuals and model collective bargaining language and codes of practice[55]. Such international cooperation would, we feel, provide a practical first step in a global trade union response to the excesses of computerised control in the modern workplace.

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9. The concepts of 'high' and 'low trust' are derived from Fox, A., *Beyond Contract: Work, Power and Trust Relations*, Faber, London, 1974, pp. 102–119.
10. Engineered standards are now being used in grocery warehouses in Canada, the United Kingdom, Germany, Austria, the Netherlands, Belgium, Finland, Sweden, Italy, South Africa and Australia.
11. Annual financial reports for the leading twenty US retail and wholesale grocers suggest net profit levels varied from a high of 3.5% to a low of 0.2% for 1994, with an industry mean of 1.9% amongst retail grocers and 0.6% for wholesale grocers, correspondence Research Department, International Brotherhood of Teamsters. Australian grocery warehouse profit levels are of a similar level, see *Dauids Ltd. Prospectus*, 1994, pp. 28, 67–9; *Dauids Ltd., Annual Report*, 1993, 1994, pp. 2–3; Bernasek, A., 'Grocers: Merge or Disappear', *Sydney Morning Herald*, 9th September 1991, pp. 25–6.
12. Register, O., 'Make Auto-ID Work in Your World', *Transportation and Distribution*, 1994, 35: 10, 102–112; Firth, R., 'Steps to Successfully Installing a Warehouse Management System', *Industrial Engineering*, 1995, 27: 2, 34–6.
13. Boggs, K., 'Warehouse Management Systems', *Industrial Engineering*, 1995, 27: 2, 30–2; Forger, G., 'Productivity Climbs with Real-Time Warehouse Control', *Modern Materials Handling*, 1994, 49: 3, 38–40; and Currier, R., 'Revolutionary Breakthroughs Arrive', *Industrial Distribution*, 1994, 83: 4, 126.
14. Gagnon, G., 'Labor Reporting Systems Yield Worthwhile Results', *Handling & Shipping Management*, June 1987, p. 57; Dallas Systems Corporation, 'A Total Solution for the Distribution Industry', promotional video; *McLain Grocery Co. and Teamsters Local 92*, 90 LA 435; *Kroger Company and Teamsters Local 171*, 99 LA 905; transcript 'Engineered Standards' Inquiry, 27th September, 1995, pp. 3012–3 and 3019–21.
15. Lund, J., 'Computerised Work Performance Monitoring and Production Standards: A Review of Labor Law Issues', *Labor Law Journal*, 1991, 42: 4, 195–203.
16. While the use of wage incentive schemes is relatively rare in the unionised section of the US grocery warehousing industry, a number of Australian warehouses have introduced such payment schemes. Transcript of Industrial Commission of NSW, IRC94/1145, 'Engineered Standards', 15th August 1995, pp. 2035, 2046, 2054 and 2064; Shop Distributive and Allied Employees' Association (SDA) and Coles Supermarkets Distribution Centre (Hampton Park, Vic.), Certified Agreement, pp. 50–54.
17. Transcript 'Engineered Standards' Inquiry, 28th April 1995, p. 1408, 18th May, 1995, pp. 1740–42, 1746 and 1796, 15th August 1995, p. 2031. *Scrivener of Pennsylvania* and *Teamsters Local*

430. Jaffe, 1993, unpublished arbitration decision, p. 12.
18. National Institute for Occupational Safety and Health, *Application Manual for the Revised NIOSH Lifting Equation*, NIOSH Publications, 1994, pp. 94–110.
 19. NIOSH, *Hazard Evaluation and Technical Assistance Report; Big Bear Grocery Warehouse Columbus, Ohio*, August 1993 (HETA 91-405-2340) and NIOSH, *Hazard Evaluation and Technical Assistance Report: Kroger Grocery Warehouse Nashville, Tennessee*, 1995 HETA 93-0920-2548.
 20. NIOSH, *Kroger Grocery Warehouse*, p. 19, emphasis added.
 21. Transcript 'Engineered Standards' Inquiry, 15th August, 1995, p. 2038.
 22. Transcript 'Engineered Standards' Inquiry, 8th May 1995, p. 1619; 18th May 1995, pp. 1739–40, 1767; 15th August 1995, pp. 2050, 2066–7; Industrial Relations Commission of NSW, "Engineered Standards" in the Warehouse Operations and Distribution Industry: Report to the Minister, 1996, pp. 242–5.
 23. Interviews Sydney warehouse employees, 7th February, 11th and 15th June 1995. Transcript 'Engineered Standards' Inquiry, 15th August, 1995, pp. 2035 and 2073, 18th August, 1995, p. 2153.
 24. NIOSH, *Big Bear*, pp. 12–3 and NIOSH, *Kroger*, pp. 13–4. Such jobs are often psychologically stressful and low in job satisfaction, see Landisberger, P., 'Occupational Stress Among Health Care Workers: A Test of the Job Demands-Control Model', *Journal of Organizational Behaviour*, 9, 1988, pp. 217–39.
 25. Slichter, S., Healy, J. and Livernash, E., *The Impact of Collective Bargaining on Management*, The Brookings Institute, Washington, D.C., 1960, pp. 342–71; and McLaughlin, D., *The Impact of Labor Unions on the Rate and Direction of Technological Innovation*, National Science Foundation, Washington, D.C., 1979.
 26. See for example Turner, *Democracy At Work*.
 27. While Slichter et al. distinguished five forms of union response to technological change which they termed 'willing acceptance', 'opposition', 'competition', 'encouragement', and 'adjustment', there is little evidence of 'competition' or 'encouragement' in the reactions of US and Australian warehouse unions to engineered standards. See Slichter et al., *The Impact of Collective Bargaining*, pp. 342–71.
 28. Most International Brotherhood of Teamsters collective agreements contained standard contract language which obliged the employer to provide 'a fair day's pay for a fair day's work'. In return, the Union agreed to co-operate with management in maintaining the highest level of efficiency and productivity. While Australian industrial awards lacked similar language, the concept of a 'fair day's work for a fair day's pay' was commonly used by union officials in their negotiations with warehouse managers, interview Frank Belan, NSW State Secretary, National Union of Workers, 24th March, 1995.
 29. A number of unions represent grocery workers in the US, including the International Brotherhood of Teamsters, the United Food and Commercial Workers and the International Longshoreman's and Warehouseman's Union. By far the largest is the Teamsters who have organised a warehouse division and claim a membership of nearly 400,000 warehouse workers in both the US and Canada.
 30. Although the union was largely successful in obtaining such information under the *National Labor Relations Act*, see for example *NLRB v. Safeway Stores*, 622 F.2d 425; 104 LRRM 2765 (CA 9, 1980).
 31. Despite the reliance of Australian unions on state regulation, legislative and award provisions on technological change merely require employer notification of impending technological changes that might result in job losses, or in some cases consultation over proposed technological change. Management's prerogatives in this area are not restricted by the requirements for consultation. See Deery, S., 'Unions and Technological Change', in Ford, B. and Plowman, D. (eds.), *Australian Unions: An Industrial Relations Perspective*, Macmillan, Melbourne, 1989, pp. 269–85.
 32. Bramble, T., 'Award Restructuring and the Australian Union Movement: A Critique', *Labor and Industry*, 2: 3, 1989, pp. 372–98.
 33. SDA and Coles Supermarkets Distribution Centre Hampton Park, Certified Agreement, November 1989; correspondence SDA Victorian Branch, 23rd June 1995 and South Australian Branch, 18th July 1995.
 34. Negotiations with the South Australian branch of the NUW are currently occurring over the introduction of engineered standards in warehouses covered by this Union, correspondence South Australian Branch NUW, 24th June 1996.
 35. Transcript 'Engineered Standards' Inquiry, 6th September 1995, pp. 2653–5.
 36. National Union of Workers and Franklins Limited Victoria, Warehouse Enterprise Agreement (C No. 35030 of 1994); Davids Distribution Pty Ltd—Loganlea and The Federated Storemen and Packers' Union of Employees (Queensland Branch) Certified Agreement (No. CA224 of 1994); Davids VGD Pty Ltd and National Union of Workers Agreement (C No. 20030 of 1995).
 37. *Certified Grocers of Illinois Inc.*, 273 NLRB 1608, 118 LRRM 1206 (1984).
 38. See for example, *Harper v. Godfrey Co.*, 839 F. Supp. 583 (E.D.-Wisc., 1993), which details a strike over the use of casual workers and increased productivity standards imposed under an engineered standards system in 1985.
 39. Under Section 8(d) of the *Labor-Management Relations Act* (1947), trade unions are prohibited from striking during the life of a collective contract. Given this inability to take strike action,

unions have access to binding grievance arbitration. Typically, engineered standards systems are initiated by employers during the term of a collective contract, thereby limiting union resistance.

40. Two examples in this regard include *Associated Wholesale Grocers* (FMCS 83K/16519, Seinsheimer, 1983) where the union relied upon expert testimony regarding the inappropriateness of the underlying industrial engineering study, and *Safeway Stores (Denver, Colorado) v. Teamsters Local 537* (Wheeler, 1980), where the union challenged the legitimacy of using a specific industrial engineering technique in calculating warehouse standards. In both cases the arbitrator found in favour of the employer.
41. A seven-part test is used in which the following questions are applied to the facts in evidence: (a) Did the employee know of the existence of the work rule allegedly violated? (b) Had the rule been effectively communicated to all employees? (c) Had the rule been equitably and consistently enforced in an even-handed manner? (d) Was the rule reasonable and necessary for the safe and efficient operation of the employer's business? (e) Was there a full and fair investigation of the alleged rule violation? (f) Did the employer have sufficient proof as to the employee's alleged guilt?; and (g) Did the disciplinary action fit the alleged offence? The presence of one or more negative answers to these questions will undermine the employer's case; the more negative answers, the weaker their case and the more likely the arbitrator is to overturn or reduce the disciplinary penalty. See Elkouri, F. and Elkouri, E., *How Arbitration Works* (Bureau of National Affairs, Washington D.C., 1985).
42. *Orville Products* 88 LA 204 (Dworkin, 1987).
43. In *Alfred M. Lewis v. NLRB* 5987 F.2d 403, 99 LRRM 2841 (CA 9, 1978), the Fifth Circuit Court of Appeals overturned earlier arbitrator rulings and held that the duty to bargain collectively with respect to 'wages, hours and other terms and conditions of employment' included production quota systems and related disciplinary sanctions. In this case the Court found that the employer had violated s8(a)(5) of the National Labour Relations Act by failing to bargain with the union prior to the introduction of engineered standards in the warehouse. This point was reinforced in *Scrivenor of Pennsylvania v. Teamsters Local 430* (Jaffe, 1993).
44. *C & S Industries*, 62 LRRM 1043, 158 NLRB No. 43 (1966), *NLRB v. Crystal Springs Shirt Company*, 106 LRRM 2709 (CA 5, 1981).
45. Interviews Frank Belan and Andrew Joseph, Industrial Officers NSW Branch NUW, 25th May 1995.
46. Higgins, E., 'Jobs Risk in "Watch" Row', *The Australian*, 28–29th January, 1989, p. 7.
47. Major disputes occurred at Davids Holdings and Franklins Ltd. during April and May 1994 prompting the establishment of the Industrial Commission inquiry. See Wright, C. and Lund, J., 'Best Practice Taylorism: "Yankee Speed-Up" in Australian Grocery Distribution', *Journal of Industrial Relations*, 1996, 38: 2, 196–212 and Industrial Relations Commission of NSW, "Engineered Standards", pp. 61–82.
48. While noting the potential health and safety implications of engineered standards, the Inquiry report upholds the employers' right to use such systems and measure the work performance of employees. The report recommends greater consultation between unions and management in the implementation of such systems. See Industrial Relations Commission of NSW, "Engineered Standards", pp. 1–12.
49. The NSW Industrial Commission recently ruled that prosecutions of the NUW for breach of strike injunctions in late 1996 would go ahead. The union now faces the possibility of deregistration or a \$100,000 fine. *Workforce*, issue 1107, March 14, 1997, p.1. For details of recent changes to Australian federal labour law, see MacDermott, T., 'Industrial Legislation in 1996: the Reform Agenda', *Journal of Industrial Relations*, 39: 1, 52–76.
50. See for example, *Teamsters Local 738 v. Certified Grocers Midwest*, AAA#51-300-00296-95, Fletcher, 1996.
51. A union training manual on engineered standards has recently been published by the Teamsters—Lund, J., *Watching the Clock* (International Brotherhood of Teamsters, 1996). This is being supplemented by regular training sessions for US and Canadian union delegates.
52. Examples here include Gateway Foods of LaCrosse, Wisconsin which was cited by the US Occupational Safety and Health Administration (OSHA) in 1990, see OSHRC Docket No. 89-2373, and West Coast Groceries, Tacoma, Washington which was cited by the state Department of Labor and Industries for various ergonomic violations, see Citation and Notice No. 111390589, Docket No. 92 W012.
53. One example is Norway's *Data Act* (1978) which requires a government licence be issued for all electronically processed data files in public and private sectors and prohibits continuous monitoring for whatever purpose. Such legislation has been supplemented by an agreement between the Norwegian Federation of Trade Unions (LO) and the Norwegian Employers' Federation (NAF) which requires that, 'detailed control and surveillance of the individual employee in the person's working situation shall not take place without the cooperation of the organization of the employees'. See *Data Act* (Act No. 48, 9 June 1978, *Norsk Lovtidend*, Part I, No. 18, 1978). For a review of national laws and regulations concerning workplace monitoring and surveillance see International

Labour Office, *Conditions of Work Digest: Workers Privacy*, ILO, Geneva, 1993, Part II.

54. In the United States, the Teamsters have had some success in negotiating directly with engineered standards consultants and then seeking to extend these agreements to all warehouses using the services of these consultants.

55. One example of such international union cooperation over the introduction of new work technologies is the International Transport Workers Federation's research into the development of satellite monitoring in road transport. See 'The Computer At the Wheel', *ITF News*, No. 9, November 1996, pp. 8-9.