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Cross-national Comparisons of New Career Pathways for Industrial Supervisors in France, Germany and the United Kingdom

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Drexel, I., Möbus, M., Gérardin, F. Grasser B., Lhotel, H., Brown, A., Maguire, M. and Baldauf, B.

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Oxford and Warwick Universities

Editor's Foreword

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European Leonardo CALL Project Team:

Project Conceptualisation and co-ordination: Ingrid Drexel (ISF, Munich)

France: (CEREQ and GREE)
Martine Möbus, Frédéric Gérardin, Hervé Lhotel, Benoit Grasser

Germany: (ISF, Munich)
Ingrid Drexel

United Kingdom: (IER, University of Warwick)
Alan Brown, Malcolm Maguire, Beate Baldauf, Rachel Mulvey

Distribution of responsibilities for the production of this report:

The principal authors, who carried out the cross-national analysis upon which much of this report is based are: Ingrid Drexel, Martine Möbus, FrédéricGérardin and Hervé Lhotel.

The English team of Alan Brown, Malcolm Maguire, Beate Baldauf and Rachel Mulvey carried out all the translation and editing duties.

Each national team was responsible for a national report upon which their respective chapters and national conclusions were based.

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1. Introduction and summary

There is some quantitative evidence on the volume of substitution of traditionally qualifed supervisors in industry by more highly qualified staff, but very little is known about which forms substitution takes, the basic conditions facilitating substitution policies and the company goals associated with it as well as the consequences of this policy. This study has tried to address this gap, drawing on case study research in the UK, France and Germany. Three case studies in two industries (mechanical engineering and chemical industry) have been conducted in each of the three countries covered. The large companies studied had been chosen because they had substitution policies in place. A comparison of the case study features with the national contexts revealed that the German case studies are more of an exception to national development than the UK and French ones.

The 3 year study was funded by the European Commission under the LEONARDO DA VINCI programme. It brought together researchers from Céreq (France), ISF (Germany) and IER (UK). The study was conceptualised and co-ordinated by Ingrid Drexel at the ISF in Munich. The project report (Drexel et al, 2000) was produced in German, with the national sections written in their respective languages, and this formed the basis of this report. This report therefore represents an attempt to make the cross-national commentary available in English. The cross-national analysis was carried out by the French and German teams, with the translation and editing the responsibility of the English team, for whom Rachel Mulvey carried out translations from French to English. The national overviews, case study descriptions and national conclusions were produced by the national teams.

Substitution in this context is defined as the policy of recruiting higher qualified younger employees without substantial work experience into supervisory and management positions in production and maintenance (in short: industrial supervisor positions), that would previously have been filled with semi-skilled or skilled workers, promoted after many years of service. However, there are cross-national differences in the management structures, the education and career paths of traditionally qualified industrial supervisors and the qualifications of the highly qualified substituting for promoted workers in supervisory positions. The core groups of the highly qualified substituting for traditionally qualified workers are higher technicians in France (who have completed a 2-year HE course), engineers in Germany (who have completed a 4-year HE course at *Fachhochschule* (FH)) and university graduates in the UK.

National contexts

In the **UK** there are currently no statistical data available on the extent of substitution of highly qualified staff for traditionally qualified industrial engineers. However, qualitative evidence and other indicators suggest that substitution in the UK is much more advanced than in France and Germany. A further increase in the substitution of promoted workers by the highly qualified is most likely to take place in the UK, due

to the following factors: a swift turnover in the workforce in the wake of high external flexibility; the persistent lack of a pool of qualified workers and the concurrent swift expansion in higher education; and a market-led regulation of the relationship between the level of education and employment, reinforced by the decline of trade union power.

In **Germany**, the proportion of FH engineers occupying Meister positions (the German equivalent to industrial supervisors) has increased from 1 per cent at the beginning of the 1990s to about 4.6 per cent in 1998 according to representative surveys. There is some scope for further substitution, but there are a number of features restricting the extent of substitution, such as a big reservoir of traditionally qualified Meisters; a relatively controlled expansion in the number of the highly qualified, particularly engineers, whose figures are even dropping according to recent statistics; and the maintenance of the principle of occupational labour markets, regulated by contracts.

Substitution policies seem to have a certain tradition in **France**. The share of higher technicians among the industrial supervisors has increased from 4.4 per cent in 1982 to 11.7 per cent in 1997. France seems to take a middle position in terms of a likely further increase in substitution, as it favours co-existence policies. The French situation is characterised by the customary employment of higher technicians as industrial supervisors; a formal correspondence between the pay band of the *maîtrise* (the French equivalent to the industrial supervisor) and the qualification level of higher technicians, laid down in the collective agreements; the necessity to create a balance between the opportunities the rapidly growing supply of highly qualified technicians offer and the reduced recruitment capacities of companies; and the more numerous career opportunities for workers, emanating from the greater role medium-level positions play in contrast to other countries.

Forms of substitution

The case studies have revealed a wide range of substitution constellations in terms of how highly qualified staff are being introduced to industrial supervisor positions. These policies can range from recruiting highly qualified staff to industrial supervisory positions straight after they have finished their studies, to placing them after completion of graduate training programmes, to recruiting them after they have gained some years of practical experience, either as workers, specialist staff or even managers. However, some kind of work experience was expected in most case studies.

These constellations indicate the existence of cross-national patterns, country specific developments and also case specific features. For example, in the **French** case studies policies have been put in place preparing employees for management positions. Such policies were absent in all three **German** case studies due to specific circumstances, whereby the companies usually either recruited recently qualified graduates or experienced engineers. The **UK** case studies revealed that graduates were sometimes initially recruited to positions as technicians or workers. But they stood a better chance of being promoted after a couple of years with the company than those without a degree. However, it needs to be mentioned that all three countries covered employed promoted workers as well as highly qualified staff as industrial supervisors.

Cross-national conditions facilitating substitution policies

The case studies have shown that a number of conditions facilitating the establishment of new recruitment and selection policies for industrial supervisors appear to display similarities across the companies and the countries covered. But their effect on the new recruitment and selection policies varies between companies and countries. Other more specific factors are also relevant.

Context-related factors

All companies covered have *rationalised employment*, although the extent, type and timing of the measures vary across the companies studied. These changes have impacted on the number of industrial supervisor positions; they have in most cases weakened the position of workers as the recruitment pool for supervisor positions; and they tend to have put more pressure on industrial supervisors. *(Local) labour market conditions* also facilitated the new recruitment and selection policies in a number of cases. Companies might have gained a position on the market that allowed them to recruit (highly) qualified staff more easily and to offer highly qualified staff less rewarding positions in cases of internal restructuring. Irrespective of the company and the country, there were only *few manifest conflicts* over the establishment of the new recruitment and selection policies due to a range of factors. The production units of all companies covered are part of multi-national combines or companies. Following pressures to maintain productivity, they have undergone *similar changes in relation to production structures*, leading to changes in skills requirements.

Common goals of the new policies

All nine companies covered argued that changes in recruitment and selection policies were mainly caused by *changes in skill demands* associated with the new role of the industrial supervisor. Industrial supervisors are now expected to have acquired a more formalised body of knowledge than their predecessors to cope with technical skill demands and more formalised ways of working; to practise a new leadership style, which puts more emphasis on motivating employees and further developing their skills instead of simply controlling staff; and to have social and commercial skills, as industrial supervisors now have to liaise with a broader range of people, both internally and externally. Quite often traditional industrial supervisors are seen to be lacking these qualifications. The highly qualified are seen to be offering a whole range of required and valued skills, and they are regarded as capable of delivering the cultural changes required. Companies have started to *call into question established career paths for workers*. Work experience should no longer be the sole criterion for promotion to a supervisory position in production. Instead, new criteria are to be established and they are to be evaluated employing new recruitment and selection tools, particularly in UK and French companies, in an effort to make recruitment and selection processes more objective. Some companies wanted to open up supervisory positions to groups other than skilled workers, partly in an effort to break the previously prevailing close working relationships between workers and industrial supervisors. Changes in recruitment and selection policies have also been motivated by a desire to reduce pay levels.

Differences in context, extent and forms of substitution

Apart from the similarities in the establishment of new recruitment and selection

policies, a number of peculiarities and differences exist, often related to the country in which the company is situated.

Economic and organisational conditions

The three UK companies have seen a very dramatic decline in the workforce, unknown to companies in France and Germany. There were also differences between countries in whether or not measures to cushion redundancies were in place. In three companies, the establishment of new recruitment and selection policies seems to have been facilitated by the way the workforce was reduced. For example, the long-lasting recruitment halt two French companies had in place seems to have favoured the external recruitment of highly qualified staff due to a lack of internal staff being considered suitable for promotion to supervisor. The contractual situation of the workforce has a strong impact on how the new recruitment and selection policies are put into practice and on the career aspirations of workers. Again, all three UK companies have reached a level of workforce flexibility unknown to the other companies in the other two countries. The roles of industrial supervisors are different in terms of number of subordinates they are responsible for and the duties of supervisors. In each of the **English** and **German** companies the number of subordinates is higher and the responsibilities of the supervisors are far-reaching compared to the situation in the **French** companies. However, it needs to be mentioned that the type of industry and the national definition of industrial supervisor plays an important role when it comes to the number of subordinates for whom a supervisor is responsible.

Vested interests of the companies in these policies

The senior management in two **German** companies want to change radically the access criteria to production management positions, partly to break the power of Meisters. In contrast, the French case study companies opted for co-existence policies, to secure social harmony among workforces that have served the companies for a long time and to secure the functioning of the important internal labour market. The **French** companies also prefer young higher technicians to grow into a position as industrial supervisor. Like the French companies, the **UK** case study companies went for a co-existence strategy that involved the promotion of both traditional and graduate staff to supervisory positions.

Education and training of industrial supervisors

In the past, *traditionally qualified industrial supervisors* in **German** case study companies were recruited from a pool of qualified *Meisters*, who had already completed a comprehensive programme of continuing education and training; although in some cases skilled workers without a *Meister* qualification were also promoted to industrial supervisors. In the **UK** and **French** companies investigated, workers were first promoted to industrial supervisors and then sent on relevant training courses, as required. In the French case clear career paths existed for long-serving workers, indicating the importance of internal labour markets, particularly in the chemical industry. As regards the *new type of industrial supervisors*, the **UK** counterparts have to be prepared to take part in evaluations and (compulsory) training measures upon appointment to team-leader or team-coach. Compared to the past there has already been an explosion in the numbers of people taking supervisory management qualifications. Given the relative dearth of those with intermediate level qualifications, graduates enjoy a significant advantage in this respect over most

workers, who have mostly low level qualifications.

In the **French** case study companies higher technicians without professional experience are rarely recruited as industrial supervisors and hardly ever straight into the higher levels of production management. Companies also intend to create qualification pools (workers with higher level qualifications) to assist in the recruitment and selection of industrial supervisors, although the type of qualifications required vary between companies. The functioning of the internal labour market is therefore not called into question.

In **Germany**, two companies studied had recruited experienced engineers, managers and technicians to industrial supervisor positions, whereas one company had employed young engineers without professional experience as Meisters. In none of the cases studied were the highly qualified recruited to worker positions prior to their employment as industrial supervisors. In future, two companies plan to reserve access to production management positions to engineers only. One company intends to keep its options open, but expects Meisters and technicians to complete further comprehensive continuing education courses.

Consequences of substitution policies

Substitution policies have an effect on the employees concerned and it raises a number of resultant problems for companies. However, such an analysis of the consequences of substitution policies is faced with a number of difficulties: the long term effects of substitution policies are hardly visible as yet; current assessments of future developments may prove incorrect; and the establishment of new recruitment and selection policies occurred parallel to profound changes in work organisation and management roles, thus making it nearly impossible to separate the effects of the two developments on employees and companies.

Consequences for workers
Following the establishment of new recruitment and selection policies, the promotion opportunities for workers have deteriorated, at least in the medium term, and the conditions for promotion have changed. These changes will be felt more strongly in the German companies studied.

Consequences for traditionally qualified supervisors
Changes in recruitment and selection policies have been achieved via early retirements, dismissals or resignations of traditionally qualified managers, particularly in the German and UK case study companies. Traditionally qualified supervisors also sometimes had to take up different jobs within the company, either in staff positions in technical offices or in some cases working on production, following organisational restructuring. Their pay levels were sometimes secured (as in the **German** companies), and sometimes not (as in the **UK** companies). In contrast, traditionally qualified supervisors in all three **French** companies have kept their management positions due to a variety of reasons. With one exception, none of the companies have created alternative career paths leading up to new expert positions; instead job changes were dealt with on an ad hoc basis.

The changes in recruitment and selection polices have partly provoked demotivation and scepticism as regards the future for traditionally qualified supervisors in all **German** and **UK** companies covered. In the German companies these changes have been perceived as a devaluation of the traditional Meister qualification. In contrast, one **French** company had tried to reduce competition from the highly qualified for supervisory posts.

Consequences for the new type of industrial supervisors

The consequences of the substitution policy seem ambivalent for the highly qualified industrial supervisors, fairly irrespective of the country and the company investigated. On the one hand, the recruitment to lower level management positions opens up new opportunities for the highly qualified entering the labour market and career opportunities for those who started in jobs that were not traditionally regarded as graduate level entry. On the other hand, the highly qualified may fear for their *medium or long-term career prospects* if they stay on for too long in this type of job, if it means they have little chance of applying their technical skills, the exercise of which may be vital for other jobs. Consequently, the highly qualified have a vested interest in moving on to other jobs as specialist staff, causing relatively high levels of turnover in supervisory positions. This is particularly true for **Germany** and the **UK**. In **France**, the promotion prospects of the higher technicians working as industrial supervisors are effectively capped, as access to more senior management positions requires further demanding studies and geographical mobility.

Furthermore, there seem to be *discrepancies between the skill profiles of the highly qualified and the skill requirements* of their jobs, again fairly irrespective of the country and the companies covered. The highly qualified recruited to supervisory positions are seen as having certain skill deficits, even though in some instances they may be formally overqualified for the job. In the German case study companies, lack of certain technical and social skills and experiences were reported. The situation was similar in the UK, where it was also noticed that graduate supervisors sometimes had difficulties in gaining acceptance amongst the workers. In contrast to an often discussed hypothesis, these skill deficiencies are not only due to a lack of experience, as the examples of many highly qualified with work experience within or outside their current company show. These skills deficits may also be due a range of other factors, such as the lack of appropriate specialist technical skills and qualifications, including specific knowledge relating to the production process and the plant.

Consequences for the organisation of work

In view of the avowed lean management philosophy, it is surprising that six out of the nine companies have not reduced the number of hierarchy levels. Three companies (one in each country) have even increased the number of levels in the company hierarchy. This change was not intended, yet was necessary to cope with the resultant problems of new patterns of work organisation and changes to recruitment and selection policies. In two of these companies, traditionally qualified supervisors were employed in newly created (temporary) hierarchy levels.

It can be assumed that complex interrelations exist between the new recruitment and selection policies, the establishment of more formalised work routines and changes in the management hierarchy. More hierarchical levels and a greater distance between executives and production processes, as in some of the German companies, require

more formalised work routines, which, in turn, promote the employment of the highly qualified. And the highly qualified expect promotion prospects, requiring a good number of hierarchy levels. These complex relationships facilitate each other, but they do not necessarily imply each other.

By contrast, in the much slimmed down **UK** case study companies responsibilities were pushed down to the lower levels of (supervisory) management and to teams, and companies were much more careful that supervisors could meet much more demanding personal specifications and role expectations. In some circumstances, but not always, this favoured the appointment of graduates with relevant work experience to these positions.

Consequences for the personnel policies of the companies

In the **German** case study companies the new recruitment and selection policies could deplete the qualification reserves of companies in the long term, as many workers may be doubtful of the benefits of having to finance their own education and training without realistic prospects of promotion. But there might also be short-term effects on the companies qualification pools, as the relative value of a relevant apprenticeship might be questioned. In contrast, the recruitment of the highly qualified to worker positions will improve the qualification potentials of workers in the **French** and **UK** companies, as long as the promotion prospects of the highly qualified are seen as sufficient. However, this recruitment strategy is likely to diminish the promotion prospects of those with a suitable qualification below degree level (for example, the Baccalaureat or Modern Apprenticeship). This in turn may prevent people from embarking on this qualification route, designed to strengthen the qualification potentials of workers. If the highly qualified are only recruited to more demanding positions, a polarisation of workers may be the result, leaving those with fewer opportunities demotivated. However, in contrast to Germany a negative impact on continuing education and training is less likely to happen in French or UK companies, as it is much more likely that the employer rather than the employee takes the initiative.

As mentioned earlier, there is a tendency of a *high turnover of highly qualified staff in industrial supervisory positions*. Some German company representatives, regard this as positive, as it prevents the build-up of powerful management positions. However, there are also a number of more problematic effects. Furthermore, the skill deficits and the experiences of the highly qualified supervisors, together with the increased workload of managers in general, may in certain cases lead to a sub-optimal *execution of certain functions or to delegating certain functions to lower levels.*

Consequences for continuing education and training policies of companies

As a consequence of the new recruitment and selection policies, companies have to impart social and leadership skills to a great extent and technical skills to a certain degree for highly qualified supervisors. The extent to which these skills can at least be partly acquired through experience in a number of worker positions and internal knowledge of how the company operates depends to a large extent upon the range of skills required and responsibilities exercised in those roles. The establishment of intensive continuing education and training programmes for industrial supervisors to counteract skills deficits, as was the case in three French companies and one UK one,

requires substantial personnel management effort to organise the various stages of the training programme, and also financial resources, even more so because of the relatively high fluctuation on the posts for which they are trained.

French and **UK** companies also need to create the prerequisites for their co-existence policy, that is, the provision of continuing education and training programmes for the traditionally qualified workers aspiring to a career in supervision and management. In particular, workers may need support to develop their abilities to operate as effective learners. In the UK some such measures are in place.

Companies are being expected to promote the continuing education and training of their workforce. Where this was previously underdeveloped, as in many **UK** companies, employee development schemes have proved largely successful. However, in **German** companies, where the prospect of promotion to Meister and significantly increased financial rewards drove the continuing education and training system, the reduced promotion prospects may mean that the lifelong learning of workers will be hampered in the medium or long term. To counteract this, more initiative and investment on part of the companies will be required, as individual commitment to learning and development becomes less reliable as a driver of the continuing education system as a whole. The concept of 'competence development' is driving employee development in **France**, but insofar as it requires promotion opportunities to motivate workers where these are blocked off the rationale for the system may be undermined.

Conclusions

Drivers and future of substitution processes

There are a number of factors which seem to have contributed to the establishment of substitution processes. First, many companies covered seem to pursue substitution policies with the aim to implement new forms of production management in the hope *of achieving higher productivity levels*. The highly qualified seem to be more open to such changes and they are equipped with valuable knowledge and skills. Second, *weaknesses in the education and training* of workers, shortages of suitable candidates for positions in production supervision and management, the lack of continuing education and training, and the need to strengthen the group as well as the status of industrial supervisors, all favour the establishment of substitution policies. There is also a complex connection between the new recruitment and selection policies and certain elements of a Taylorist organisation of labour, particularly formalised production management, a great number of hierarchies and a division of labour that is based upon the lower level workers exercising mainly low-level skills.

Third, substitution policies are helped by a continuing *supply of highly qualified entrants* to the labour market and by the more practical alignment of much higher education. But these factors cannot sufficiently explain substitution; instead the vested interests of companies in wanting to introduce more radical changes outwith substitution policies play a crucial role. Weaknesses too in the mismatch between skill potentials and the changing duties of traditional industrial supervisors seem to have at least partly contributed to the establishment of substitution policies. As discussed earlier, further increases in substitution processes seem most likely to take part in the **UK** and least likely in **Germany.** The situation is less clear-cut in **France**. On the one

hand the imortance of internal labour markets does not indicate an accelleration of substitution polices. On the other hand the extent of the substitution processes depends on the general labour market, with deteriorating job prospects of school-leavers increasing substitution.

Implications of models combining both access routes to supervisor posts

Combining elements of the traditional supervisor career development and the employment of highly qualified staff can avoid abrupt changes in recruitment and selection policies. There is considerable demand for such *synthesis approaches*, particularly in the UK. But in order to be successful four key principles need to be established. They relate to keeping access to promotion fairly open, raising qualification potentials of future supervisors, elevating the status of promoted supervisors and estabilshing a generally acknowledged qualification. Those companies studied who actually had adopted a synthesis model have not always combined all four principles. The *co-existence model* is currently the dominant pattern. But it cannot be ruled out that it might just be a temporary phenomenon to facilitate the transition to recruiting more and more highly qualified staff. Highly qualified might also be in a more advantageous position to compete for supervisory posts due to their faster track promotion and the increasing convergence between job profiles of supervisory positions and the skill profile of the highly qualified. And finally, at least in German companies, workers will be less committed to continuing education and training given deteriorating promotion prospetcs.

Implications of substitution processes for VET and LLL

If substitution processes are going to increase significantly, the overall loss of promotion opportunities would make *vocational education and training* (VET) less attractive in countries like **Germany** where the VET system has traditionally been very strong, causing far-reaching consequences also for higher education. This could eventually lead to a situation where there might be little chance of reviving the worker promotion path, as it seems no longer credible or feasible. Ironically, the decline of VET from the 1970s through to the mid 1990s in the **UK** means that the job prospects for those entering the labour market now with intermediate level craft and technician qualifications are extremely buoyant in many occupational fields and geographical areas. In **Germany** substitution policies threaten to undermine and destabilise processes that have led to substantive commitments of individuals to continuing education and training. Consequently, more emphasis will need to be put on initial education undergone before entering working life or shortly thereafter. The vision of *lifelong learning* (LLL) will then be reduced to a range of short courses necessary to develop the appropriate skills. In contrast, employing more highly qualified staff as industrial supervisors in the **UK** seems part of a much more general movement to upgrade the skill levels of all employees. Continuing education and training, and the need to combine learning and working, are becoming more important, although it should be remembered that many UK companies were starting from a very low base in this respect.

The introduction of new recruitment and selection policies also had an impact on continuing education and training of the highly qualified. The discrepancies between required and available skills of the highly qualified have prompted the provision of quite extensive and fairly individualised personal and continuing education development programmes. Yet *generally acknowledged certificates* facilitating labour

market mobility have rarely been developed. More specific conclusions that relate to education and personnel policies are to a large extent country specific as the principles of education policy and the assessment of substitution processes are very much affected by national traditions.

2. An overview of substitution policies of traditionally qualified supervisors in France, Germany and the UK

2.1 Substitution of promoted workers to supervisory positions in production and maintenance: what does it actually mean in the countries covered?

The substitution of promoted workers to supervisory positions in industrial production and maintenance by people with a higher level of formal education occurs under different conditions in the countries covered. In order to make a cross-national comparison we need to make clear what these processes typically mean in each country.

First, **the management structures in production and maintenance** in the French, German and UK companies are differently tailored:

- **French** companies are typically characterised by a number of levels of supervision and management, ranging from *chef d'équipe*, leader of a small team with a relatively low number of subordinates, to *haute maîtrise*, a senior supervisor with a much wider range of responsibilities and subordinates; consequently duties and responsibilities are heavily graded.

- Supervisory positions in **German** companies have typically been relatively homogeneous and are becoming even more so following recent organisational changes. Junior supervisory positions below the level of *Meister* are disappearing, leaving the *Meister* with a higher number of subordinates and more comprehensive duties and responsibilities. The *Meister* have traditionally always had a much wider range of duties and responsibilities for the organisation of production than industrial supervisors in the UK or France.

- In a similar way to France, the typical **UK** company traditionally had many levels of supervision and management. In contrast to other European counties, the relative share of managers among the overall workforce in the UK is higher, and the management levels include positions regarded elsewhere as equivalent to technical specialists. Therefore, the role of the supervisor in the UK seems relatively heterogeneous, and in some instances the responsibilities of production managers would be more akin to the *Meister* and the *haute maîtrise* than to those of supervisors.

In view of these differences it was neither possible nor sensible to identify one level of supervision and management considered identical in terms of responsibilities and duties. Instead, all levels of supervision and management were covered which had been filled by promoted workers in the not too distant past. We then had to arrive at a collective name for this group with responsibilities ranging from supervision or support for a small group involved in production and maintenance through to overall responsibility for the organisation of complex production processes. Production-related supervisors and managers is perhaps the most accurate description, but the term is too unwieldy for use throughout this report. Production manager, as a term in the English language, does not usually encompass the more junior levels of supervision, so we have decided to use the term **industrial supervisor** as the collective name. Although this too stretches the term in English so as to include

production managers, it does have the considerable advantage in this context as being a more meaningful translation of *Meister*, a term which in German incorporates far greater continuity between supervision and management than traditionally applied in practice in the UK.

Second, the **education and career pathways through to traditional supervisory and management positions** in the three countries vary. In France and the UK, supervisors are less likely to have undergone relevant initial formal education and training (such as completion of a craft apprenticeship) or comprehensive continuing education (resulting in supervisory qualifications) prior to appointment as supervisors. In Germany, in contrast, an increasing majority of those occupying the formal position of *Meister* have both a craft qualification and have completed their formal continuing education (resulting in the award of the *Meister* qualification) prior to their appointment.

Third, the **education pathways of the highly qualified substituting for promoted workers in supervisory positions** vary depending on the structure of the national education system:

- In **France**, the recruitment of staff with higher technician qualifications *BTS* (*brevet de technicien supérieur*) or *DUT* (*diplôme universitaire de technologie*) is regarded as the central group involved in substitution. This group has completed a two-year higher education course equipping them for positions in technical support and production. The more highly qualified graduate *ingénieurs* do not seem to be considered for substitution at all, and those with a university entrance qualification (*baccalauréat*) are seen as the precursors of the current substitution policy.

- In **Germany**, the recruitment of engineering graduates, primarily those with a degree from a Fachhochschule (FH), are seen as the central group involved in substitution. These FH engineers have completed a four-year degree course (the equivalent of a UK MEng degree), including periods of practical training. A specific feature of this group is that approximately two thirds have completed an apprenticeship in the dual system prior to entering higher education. The FH degree prepares graduates for positions in production planning, research and development as well as production. Technicians are not considered within the context of substitution as they have traditionally had similar patterns of career progression as skilled workers who go on to become *Meister*.

- In the **UK**, graduates form the central group involved in substitution. As undergraduate education becomes more and more heterogeneous, and encompasses people with different entry qualifications, including those with previous job experience, it was not considered appropriate to single out a specific group of graduates as in the vanguard of substitution.

2.2 Substitution processes - the quantitative dimension

Substitution policies seem to have a certain tradition in **France**. The share of higher technicians among the industrial supervisors has increased from 4.4 per cent in 1982 to 11.7 per cent in 1997. Statistics also show that higher technicians are more often employed in the second management level (c*hef d´atélier*) as opposed to the first

management level *(chef d'équipe*) (15 versus 9 per cent of industrial supervisors have higher technician qualifications). Some companies started recruiting higher technicians for industrial supervisor positions in the 1980s, whereas others have followed after the end of a period of many years when there had been a halt to recruitment. The somewhat negative experiences of the first group seem to have led to a quantitative reduction in the extent of substitution, with many companies adopting instead a policy of 'co-existence' of higher technicians and former workers.

In **Germany**, substitution seems to have been very limited in scope. According to representative surveys, the proportion of FH engineers occupying *Meister* positions has increased from 1 per cent at the beginning of the 1990s to about 4.6 per cent in 1998. If company plans are to be realised, substitution is likely to increase, mainly in large companies, which have been the main drivers of substitution so far, but also in some small and medium sized enterprises.

Statistical data available for the **UK** until the end of the 1980s indicated that 3 per cent of those employed in supervisory positions were graduates (Steedman, Mason and Wagner, 1991). Whereas a later qualitative study conducted in the middle 1990s reported that 20 per cent of the supervisors had a degree (Mason, 2000). Apart from this evidence other indicators also support the assumption that substitution today is much more advanced in the UK than in France or Germany. These indicators include the loosening of the relationship between formal level of education and hierarchy levels in employment organisations following the massive increase in higher education (Green, McIntosh and Vignoles, 1999). Although most graduates are in what they regard as career-related employment within three years of graduation (Elias et al, 1999), they are often willing to start at lower levels and work towards what they regard as 'graduate jobs'.

2.3 Substitution processes - case study evidence in a cross-national perspective

The case studies revealed a wide range of substitution constellations, indicating the existence of cross-national patterns, country specific developments and also case specific features. Some outline characteristics of the three case study companies in each of the three countries are given in the following table.

Table 1: Characteristics of the case study companies

	French case studies
FC1	FC1 is a petrochemical company, part of a US-owned multinational group that has 1,500 employees in France, virtually all of whom are on permanent contracts. It now has two subsidiary companies: FC1a has been in existence for 40 years and employs over 1,000 people, while FC1b was set up in 1991 and employs over 200 people. The continuous process plants are located in the North West, with FC1a producing plastics for a wide range of industries, while FC1b produces polymers primarily for the plastics industry.
FC2	FC2 is a major French-owned multinational group with interests in oil exploration, refining and distribution, chemicals and pharmaceuticals. It employs almost 20,000 people in France. The case study site was built in the South West in 1982, produces

	chlorine derivative base chemicals by continuous process, and employs 800 people virtually all of whom are on permanent contracts.
FM	FM is a major German-owned multinational engineering group, established in 1946, employs over 20,000 people world-wide. The case study site was built in the North East in 1959, specialising in the manufacture of ball bearings, principally for the automotive industry but also for machine tools, robotics and agricultural machinery. It employs 2,600 people the great majority of whom are on permanent contracts.

German case studies

DC	The company DC is part of a world-wide operating German chemical company with their HQ elsewhere in Germany. It has a long tradition, is renowned and has a substantial research and development department. In 1998, the company had approximately 3,300 employees on their payroll, around 300 of whom were university graduates (including 85 engineers), 100 FH graduates (including 65 engineers) and nearly 40 *Meister*.
DM1	DM1, a mechanical engineering company, produces supply parts for the car industry and other industries. It is also part of a world-wide operating German company, having its HQ established elsewhere in Germany. In 1998, the company employed nearly 2,000 employees, including more than 20 graduates from universities or FHs and 50 *Meister* or technicians.
DM2	DM2, also a mechanical engineering company, produces agricultural machines. The case study site is the German HQ of an American firm, and consists mainly of a production plant, but it also has a large development department and a production planning department. In 1998, approximately 2,200 employees were on the payroll, including 570 salaried employees and 660 workers.

UK case studies

UKC	UKC was formerly the largest UK oil and chemical company. In 1999 it merged with an American company, and became the second largest oil company in the world. At the case study site in North East England originally the emphasis was on production for the oil industry, but latterly the production of chemicals has become more significant. Currently, there are approximately 1,200 company employees on site, with, at any one time, about 100 agency workers and between 200 and 600 contractors.
UKM1	UKM1 is a major producer of engines for agricultural machines and vehicles, industrial vehicles and machinery, boats and earth moving equipment. The company, formed in the 1920s, had been British-owned and family run, until it was taken over by a US-based multi-national company whose main product was earth moving equipment. At its peak over 20 years ago the company employed 10,000 people in Eastern England, but now it employs just 1,600, and organises production on a team-working basis.
UKM2	UKM2 is a UK-based multi-national engineering construction company involved in large scale international engineering and construction projects, such as oil rig construction and major road-building schemes. As part of a strategic decision the

company is getting more involved in providing products and facilities services to energy, utilities and transport industries. The case study site in Northern Scotland is involved in engineering construction and employs approximately 900 'core' and around 2,500 contract staff.

In terms of how the highly qualified are being introduced to industrial supervisor positions, the following typical constellations can be differentiated:

- recruitment of highly qualified staff straight into management positions directly from education (DC and in exceptional cases in FM)

- recruitment of highly qualified staff directly from education onto training programmes, which combine job rotation in worker positions with accompanying formal/informal learning processes (FC2, FM in the case of *chefs d´ilôts* and UKM1 in case of team-coaches)

- promotion of highly qualified staff who have worked with the company as workers or technicians for some time (UKC in case of team-leaders being promoted to day performance engineers; UKM1 in case of team leaders being promoted to team coaches; FM in case of promotion to *responsable d´équipe*, FC1a in case of management positions in maintenance; FC1b in case of future management positions in production)

- selection of highly qualified staff who have worked with the company as specialist staff (e.g. in production planning) or in junior management positions, before being promoted in the case of DM1 to *Betriebsleiter* and in the case of DM2 to *Moduleiter*, both of which are more senior management positions

- recruitment of highly qualified new staff who have worked with other companies to gain technical and/or leadership experience (FC 1b; UKM1).

All three countries covered employed promoted workers as well as highly qualified staff as industrial supervisors. However, in the French case studies policies have been put in place preparing employees for management positions. Such policies were absent in all three German case studies as engineers were either recruited straight from the FH or selected after they had spent some time with the company. But it needs to be mentioned that these recruitment and selection policies were established under special circumstances where there was little general recruitment for a number of years after major redundancies. The UK case studies revealed that graduates were sometimes initially recruited to positions as technicians or workers. Yet after a couple of years with the company they stood a better chance of being promoted than those without a degree. The question, however, of whether or not these case study results can be generalised remains open.

3. New pathways leading to positions as *maîtrise industrielle* in production industry: an overview on the French situation

3.1 Introduction: significant factors in the new politics of recruitment of *maîtrise industrielle*

This chapter interprets the data collected in consideration of the central research question: to what extent have the new access routes to positions as industrial supervisors (*maîtrise industrielle*) in production industry challenged the idea of a single career path open to factory workers and what effect has that had? The first section reports the findings from research undertaken in companies that are part of larger groups, presented as a series of case studies. The second section identifies factors that explain ways of accessing industrial supervisory positions at a national level.

The findings, set in the context of the field research, clearly identify that there is a recognised resurgence in industrial supervision, fuelled by the forced recourse to such employment by job seekers with technical qualifications at the diploma level or above at the expense of those with lower level qualifications. In the French context, this resurgence comes from the conflation of two phenomena: the rapid increase in qualification levels among those coming out of the education system and the volatility of the internal labour markets within organisations given the expansion and contraction of employment. Some key observations are that:

- access to industrial supervisory positions remains indirect, with promotion usually resulting from internal competition. The time required to gain promotion for employees with different qualifications is unequal, with current policies reflecting a tendency to reduce access for the less well qualified;

- the new politics of recruitment are not a revolution or break with the past, but have evolved over the last twenty years;

- The modification, even the erosion, of traditional career pathways is in part determined by the role of qualification levels in recruitment in large enterprises, which translates into a minimum of the *Baccalauréat* for the chemical industry and *CAP* (c*ertificat d'aptitude professionnelle)* in the mechanical engineering sector;

- Continuous professional development continues to drive access both to the function of and qualification for industrial supervision. However, the predominantly internal nature of the training and the limited weighting given to certification accords such professional mastery relatively little impact in the wider labour market.

It would appear that the potential for labour market mobility for *maîtrise industrielle* is restricted at two levels. First, there are restrictions on the external labour market, given there is little recognition of their skills base outside their particular company or industry. Second, there are even internal restrictions, given the difficulty of access to this level of management even for those who have completed the relevant training.

3.2 Significant factors in supervisory recruitment in the case study organisations

The two chemical companies in the sample had shed employees whilst the mechanical engineering company, following an earlier period of reduction, has seen staff numbers rise since 1994. Each company has particular factors that have had an impact on the definition and recognition of the *maîtrise* role. For example, one of the two chemical companies has three levels of *maîtrise*. In contrast, the mechanical engineering company maintained it had only has one level of *maîtrise*, albeit with differentiated pay levels, although analysis demonstrated that there were actually two levels. At the same time there are common approaches discernible across the sample in relation to approaches to production, organisation and management and in the collective representation of employees. There is further commonality in the context of growth of qualification levels that has had an impact on the hierarchy of the organisations. Comparative analysis of the specific factors in the particular enterprises therefore indicates a number of common trends.

3.2.1 Case Study 1 - Company FC1

This is an American multi-national corporation that now has two separate subsidiary companies, producing plastics and polymers, in France. Three factors act either to speed up or slow down employees' access to industrial supervisory positions in the two companies: the relative positions of young people and employers in the labour market; the combining of French and American principles for career management within organisations; and new patterns of work organisation and skills management.

Young people and the labour market

One current labour market trend is the over supply of young people with technical diploma level qualifications (*BTS/DUT*) and the resulting difficulty they have in securing employment at a level commensurate with their qualifications. The company as a whole is in a strong recruitment position and has 'no worries' about recruitment or relative market position. It makes use of precise data on regional salary indicators to underpin its human resource strategy. Rather than paying the prescribed rate for specified jobs by qualification level, the company pays more, and thus ensures room for manoeuvre in the recruitment of new workers at this qualification level, taking them on at a competitive salary, but on a lower pay scale. As a result, those who do not have qualifications at or above diploma level are progressively excluded. Statistical analysis bears out that qualification levels are rising and that those with qualifications below diploma level are no longer competing effectively in the labour market.

Internal labour market and career paths: the old French versus the new American model

Both companies (FC1a and FC1b) conform to the traditional large companies' model, in which the individual career progression is assumed to develop within the company, predicated on the assumption of a job for life. Two defining characteristics are internal competition for progression in line with union agreements, and a strong, if somewhat outmoded, tradition of in house training, which mitigate against lateral movements into supervisory positions as *maîtrise industrielle*. There is little scope for recruitment, especially in relation to initial entry into employment, and current labour market conditions have made employees reluctant to resign and risk unemployment.

In addition, the company has virtually stopped recruiting over the last few years, and the demographic imbalance means that fewer people are reaching retirement age.

A newer approach to performance management has been introduced by the group (to which the two companies belong) in order to update the traditional, somewhat outmoded, approach to training. The underlying principle now is that the employee must demonstrate capacity for managing a team before training will be granted. Hence whilst a diploma offers some guarantee of technical mastery, it is not necessarily seen as evidence of leadership potential.

These two approaches (the French and the Anglo-Saxon) represent a brake on the access to positions as *maîtrise industrielle* that young people with technical qualifications, such as the *BTS* [Higher Technician] and *DUT* [Technical Diploma], could expect. In any case, even if this category of qualification should generate readier access to positions as *maîtrise industrielle*, diplomas come with no guarantees as to future prospects. Nor is there any clear indication from those currently holding diplomas in such positions that any special treatment would have helped them secure the highest level supervisory positions.

New patterns of work organisation and skills management
Despite local variations within the two companies, both have become flatter organisations, affecting the management and supervision (*maîtrise*) tiers, and affecting most acutely the higher level supervisors at the layer which overlaps with management, for example Operations Chief and Team Leader. All things being equal then, the scope for promotion has been reduced. This might explain the emergence of subtle distinctions within supervisory roles that seem at first to be at odds with the vision of a flat organisational structure. By introducing skills appraisal divorced from job descriptions, the company creates room for manoeuvre in redefining the access to management positions whilst retaining parallel promotion pathways, one without management responsibility. The evidence shows that the 'new' *maîtrise* role distances the supervisor from their team members. Company FC1b is an example of this desired relationship, where the *maîtrise* is imported from outside the company, largely on the basis of certificated learning.

3.2.2 Case Study 2 - Company FC2

As part of their human resource strategy, this company has, for some time now, been recruiting new workers qualified to diploma level to revitalise the *maîtrise* role at the chemical manufacturing case study site. Whilst this strategy is relatively new, and of limited significance in terms of quantity, it looks set to develop over the next few years. At first sight, this appears to be a break with the traditional promotion to *maîtrise* through the manual ranks in favour of direct entry. There is however a further question to be asked: whether this new recruitment policy is a radical human resource reform which will end the promotion pathway for the manual worker and blur current distinctions between the *maîtrise* and management functions? The question can be addressed by due consideration of the context; the extent of commonality within the *maîtrise* function and the nature of the *maîtrise* / management dichotomy.

The specific context
Examination of both internal and external environments is necessary in order to understand the contextual factors that have a bearing on *maîtrise* recruitment. First,

there is the internal environment. The factory itself is old, and the production techniques relatively stable. There are no current indications of reorganisation towards a flatter structure, indeed there is a noticeable increase in first level management in some workshops. In contrast, because of greater emphasis on safety, quality and environmental management, operating procedures have been redrawn, with increasing formalisation of work methods. Such formalisation has favoured recruitment of diploma-holders to their first job.

The personnel is also stable, with a slight increase in recruitment of late, following a decade of no recruitment. During this decade personnel management has worked on the basis of formal job descriptions and specifications. New entrants aspiring to the *maîtrise* function are classified during their probationary period not in terms of the actual job they are taken on to do, but in terms of the job they would be entitled to by virtue of their qualifications, according to protocols agreed by collective bargaining. In this context, the new style recruitment of younger, more qualified *maîtrise* is a way of achieving two objectives:

- introducing new work methods which challenge workshop hierarchies;
- breaking the entrenched thinking which restricts access to this 'non-manager' managerial role to those promoted from the manual ranks.

Second, there is the external environment, which can be sub-divided into two parts: the impact of the parent company and of the wider labour market. Human resource managers within the company undertook a review of non-management personnel, specifically those in the *maîtrise* function, using categories including personal characteristics and the nature of the problems with which the *maîtrise* has to deal. The object of this exercise was to harmonise practice across multiple sites in order to introduce a common policy on recruitment, career progression and mobility based on skills utilisation, and this in turn would achieve the company's aim of a flatter organisation. The challenge was to design a set of management tools that could be used by *maîtrise* and manager alike to enhance their function of effective management of operatives. One approach has been to recruit only those with the Bac+2 [*Baccalauréat* followed by two years further study at undergraduate diploma level]. This approach has had varying degrees of success across the different sites. A recent company memo identified that the rate of internal promotion had been reduced, but had not yet reached the desired relative positions of two-thirds promotions and one-third new recruits.

To all intents and purposes, a diploma is now a pre-requisite for employment at any level within the company. Selection procedures have become more complex, now including a selection panel. Whilst this kind of process may sit ill with the idea of entitlement to a particular employment scale by virtue of passing public [competitive] examinations, the justification is that most employees are taken on for life so the initial selection has long term implications for both employer and employee. The company offers a good package in terms of in-service training and remuneration, and so can select carefully from a strong field of diplomates. This brief examination demonstrates that the internal and external factors combine to favour young holders of the Bac+2 in terms of recruitment to the *maîtrise* function.

Heterogeneity in the maîtrise function
As in many process production industries there are two main categories of maîtrise; the *maîtrise du jour* and the *maîtrise postée*. On the site, there is also a three-tier hierarchy: the *petite maîtrise* (with limited responsibilities); the *maîtrise intermédiaire* (with a limited span of control) and the *haute maîtrise* (where the span of control is extensive). Previous research into chemical industry identified a similar categorisation, and a similar trend to recruit new, qualified entrants rather than promoting internally older less qualified workers.

It is tempting to align on the one hand the *haute maîtrise* with young diplomates and on the other hand, the *petite* maîtrise or *maîtrise intermédiaire* with internal promotion. The reality is, however, quite different, for two reasons. Firstly, those recruited with the *DUT* [Technical Diploma] then compete internally for a head of section (*petite maîtrise*) position. Whilst a break with tradition, it is hardly direct access, although it does offer accelerated promotion prospects. In any case, this entry route might not survive; there are already talks about bringing graduates in to this function. Secondly, the recruitment to *haute maîtrise* is highly selective and recognises qualification levels as much today as has always been the case. Taking into account the net increase in education standards now achieved by those leaving education, the trend is to increase the standards required at the point of entry (from Bac to Bac+2). The shift though is not imposed by the organisation, but rather is part of a gradual process: the shift is not structural, but organic.

If this hypothesis of the 'cultural shift' holds good, there still remains the problem of separating out the diploma effect from the effect of prevailing labour market conditions, with the labour market effect resting on the tension between the newcomer and the old timer. The diplomate newcomer reaches the rank of *haute maîtrise* after several years of professional experience. These years are spent among the *maîtrise intermédiaire*, with the inevitable result of a degree of cultural conformity. While among the old timers, there is stronger identification with their erstwhile companions in the ranks than with their new found colleagues in the management echelon.

To sum up, the functioning of the internal labour market sustains heterogeneity within the *maîtrise* function, because the young diplomates start their career on the lowest rung of the ladder, perhaps after a brief period as an operative. Whilst this leads to adaptation of the function to a degree, its nature remains fundamentally unchanged and relatively heterogeneous.

The maîtrise / management dichotomy
The organisational aim is that the new maîtrise fuses with the existing management function. This is manifestly not the case at present, however, for two reasons: pay levels and relative immobility in the labour market. The average wage for the maîtrise role is closer to that of the manual worker than the pay levels of managers: 20% more than the average manual wage but only a little over half the average management salary. Only a tiny minority of supervisory staff are paid anything approaching a management salary. Mobility is inhibited by two factors: a social inhibition to move beyond a geographical locality and the transformation of *maîtrise* into a 'management' ghetto. Mobility patterns are no different in the *maîtrise* category than for the manual workers. Whilst job mobility is seen as an essential element of training

for managers, with that training organised by the parent company, the same is not seen to apply to the *maîtrise*, and this restricts their opportunities for progression.

3.2.3 Case Study 3 - Organisation FM

This organisation is currently undergoing significant changes, particularly in relation to production technology and its supervisory and management structures, especially at the *maîtrise intermédiaire* level. At the ball bearings manufacturing case study site the objective is to develop a new approach to production management whilst retaining technical excellence. The company has sustained steady growth for a number of years, and is in a strong position, offering salary levels above average in a region with below average unemployment. At present manual operatives account for two thirds of the workforce. Whilst there are some underlying tensions relating to production management and the classification of *maîtrise*, these do not pose any real threat to the change agenda. It is the strategic nature of the change to production management that acts as the driver for rationalisation of the *maîtrise* function.

This transformation is discernible in changes to the means of gaining access to the level of production-island leader (*d'équipe-chef d'îlot*). The well-trodden route from machine setter to team leader to production-island leader will no longer be available. That said, so far direct access to this level, particularly from outside the company, is rare. It is too early to determine the effect of the changes thus far, which include taking on a small number of young *BTS/DUT* diplomates. Against the backdrop of the transformation in global production methods, the new role of production-island leader seems to align more closely to the production management function than to the old supervisory role.

3.3 National factors influencing career pathways for *maîtrise industrielle*

3.3.1 Some general factors

There is no diploma specifically for *maîtrise* in the French system. The questions around the *maîtrise*, its position at the heart of enterprises, its categorisation, its relationships with the adjacent categories (manual workers, technicians and managers) are not completely new questions. Since the 1980s, large enterprises have sought to reconcile the interests of highly experienced post holders and the more highly qualified diplomate recruits to supervisory positions. The resultant tensions have been real, and were evident in the collective bargaining process. Two sets of reasons are germane. The first set relates to the considerable and rapid decline in industrial employment, leading to vast redeployment; an increase in the numbers entering higher education; and the establishment of different education and training routes leading to vocational qualifications. The second set reflect the increase in structural unemployment; the weak bargaining position of many employees; and the effect of company employment and training policies.

The problem of reconciling different interests is not simply a question of finding socially acceptable harmonisation across the old and new career paths. There is also the issue of the familiar 'French' employment pattern of a job for life, which needs to be revisited. The development of information and communication technologies and the search for efficient production management too will have an impact on the job role and function of *maîtrise industrielle*.

3.3.2 More highly qualified recruits to supervisory positions and the rise in education standards

Some of the trends in education in France from the 1980s onwards include a steady increase in standards of achievement; extended opportunities for and participation in education; curriculum specialisation and a concern to develop parity of esteem between academic and vocational pathways. Extended education is a new phenomenon; prolonged education was to offer protection against unemployment and exclusion, although the statistical evidence does not bear this out. The policy nevertheless has been for 80% of a cohort to achieve *Baccalauréat* level, hence the introduction of the vocational stream in 1985. In ten years enrolments on higher education have increased by 57%, the proportion of 19 – 24 year olds in education is 43% as against 17% in 1970 (Poulet, 1998). In particular, the number of diplomates qualifying with the *BTS* and the *DUT* each year has risen sharply: 114,095 in 1995, compared with 52,583 in 1985. By 1996, 61% of the cohort had achieved *Baccalauréat* level, compared with 30% ten years previously. Whilst the proportion of graduates attaining the recently introduced vocational degrees is only 16%, this figure has tripled since 1990. The overall level of qualification on leaving full time education (excluding graduates) increased significantly between 1980 and 1995 as shown in Table 2. As a consequence recruits for supervisory positions are increasingly likely to be much better qualified than they were in the past, and are likely to have technical qualifications such as the *BTS* or *DUT*.

Table 2: Education leavers by diploma level in 1980 and 1995 (%)

	1980	1995
None or college diploma	39	21
CAP/BEP	31	17
Bac général	11	11
Bac techno, Bac pro	4	13
BTS, DUT, other Bac+2	9	19
Supérieur long	6	19
Total	100	100

Source : DEP, apprentissage compris

3.3.3 Gaining their first job: the difficulty education leavers face entering the labour market

The difficulties many young people face in securing their first job after leaving school or college is suggested by Table 3 that shows that typically only about one in ten of the cohort enters employment directly after leaving full-time education (excluding graduates).

Table 3: Recruitment levels among education leavers (1973/4 – 1993/4)

73/74	77/78	83/84	84/85	85/86	86/87	87/88	88/89	91/92	93/94
14%	14%	11%	10%	10%	11%	10%	10%	11%	9%

Source: Fournié, D. & Grando, J.M (1995) ***Le recrutement des jeunes sortant du systeme éducatif: difficultés passagères ou degradation irrémédiable?*** *Cereq Bref 113.*

The figures indicate that, despite significant investment in education and training, rationalisation in employment has meant that young people can still find it difficult to find employment upon completing their education. They expose a mismatch between the transformation of the education system and changes in the labour market. Unemployment rates for younger people (aged 15 to 29 as shown in Table 4) and indicators such as length of unemployment before securing a job and salary levels vary according to qualification levels, and the net result of youth unemployment has been to depress wage levels. These labour market changes favour employers and, as a consequence, companies can recruit young people with higher levels of technical qualifications than they were able to do in the past.

Table 4: Unemployment rates for young people aged 15 to 29 (%)

	1992	1996
By level of diploma		
None	25.8	31.1
CAP, BEP, BEPC	15.1	20.1
Baccalauréat	11.3	16.1
Supérieur long	7.9	13.6
By age		
15 –19	22.8	24.7
20 – 24	20.5	20.6
25 – 29	12.5	16.4
Overall	16.1	20.3

Source : Meron, Minni and Thiesset (1997) Economie et statistique no. 304-305

3.3.4 The degree of vitality in internal labour markets

It appears that the *maîtrise* conforms to the model of a professional category being predicated on the three principles of 'job hierarchy, entry only at the lower levels and progression towards the higher levels' (Althauser & Kalleberg, 1995). Access requires different combinations of knowledge and skill, fusing theory and practice. On the job experience still plays an important role, despite the entitlement conferred by the acquisition of qualifications. This model has been successfully applied during a period of contraction in the labour market, although it may not transfer to other labour market conditions.

Within French companies, hierarchies remain complex and powerful, even where the management rhetoric embraces 'flat' organisations. The *maîtrise* occupies an important space between managers and workers, and progression to and from the position is mediated by strong internal labour markets, which in turn are fuelled by a low level of movement at this *maîtrise* level.

Whilst initial employment prospects for those leaving education are relatively depressed, the process of selection is rigorous. Despite human resource activity on the identification and utilisation of individual skills and competences, the initial hurdle those seeking their first job have to clear is to have a diploma, as the base level of entry qualifications has risen inexorably. Those without diplomas find themselves

progressively excluded from the job market. Big companies can take young people on at minimum wage levels without violating collective agreements on remuneration and job functions commensurate with college and university diplomas. The companies can also maintain social equilibrium by appointing a few of those recently starting in their first job to positions with some element of management responsibility.

From the research conducted, it is clear that whilst the pre-requisites for entry to the *maîtrise* function have become more demanding, and the process of accessing the *maîtrise* might well be in transition, the essential character of the *maîtrise* has not as yet undergone any radical reform. The renewal of this supervisor/management category is not a leap from one category to another, nor is it an entirely homogeneous phenomenon. Indeed the renewal of the *maîtrise* function, on a global level, is in a state of tension as a result of an inherent contradiction. The internal labour markets within large industrial enterprises and the type of transformations possible because of the relationship between the internal and external environments will serve both as the crucible for these contradictions and, simultaneously, as the means of their resolution.

4. New pathways leading to *Meister* positions in industry: an overview on the German situation

4.1 Introduction

In the German context, the substitution of traditionally qualified industrial supervisors by more higher qualified people means basically the replacement of *Meisters* by graduate engineers from the *Fachhochschulen (FH),* that are more or less comparable with the former UK polytechnics. These engineers will have undergone a shorter education and training period, usually four years, than their counterparts from universities. They will have spent a substantial time in industry or other organisations as part of their degree course and they are still more likely to have completed an apprenticeship in a relevant area before entering higher education. In other words these *Fachhochschul* engineers are very likely to have relevant work experience regarded as crucial for *Meister* positions.

For a long time the substitution of engineers for *Meister* positions was only marginal. However, recent studies (Berger 1997; Plicht 2000) seem to indicate an increase in substitution of *Meisters* for engineers in recent years. Yet this development needs to be clarified for two reasons. First, Germany enjoyed for a long time a close relationship between the level of education and hierarchical levels in employment organisations, effectively protecting *Meisters* from substitution. Engineers were not considered as suitable for *Meister* positions due to their qualifications, their social status and their (job) demands. Nor was the replacement of *Meisters* considered a sensible option due to their work experience and their high functionality for achievement of the goals of the company. Such substitution would also not normally be considered feasible, due to the establishment of the *Meister* position within the company and the power associated with the *Meister* position. Second, an increase in substitution at this time seems remarkable in view of the massive drop of *Meister* positions and the relative and absolute increase of workers holding the *Meister* qualification. This apparently inconsistent development therefore raises a number of questions regarding:

- the volume of the substitution policy (at present and in future)
- the background of this development (conditions under which substitution takes place and the vested interests of the companies)
- the pace of change (sliding versus abrupt) and types of new recruitment and selection policies (for example, total substitution of *Meisters* by engineers, co-existence of both groups or synthesis)
- short-term and long-term consequences of the substitution policy (as regards *Meisters*, workers, engineers, companies, the education system and those aspiring to a *Meister* position).

Little or nothing is known on these issues. Available quantitative information, such as that gathered by the Mikrozensus or career follow-up studies undertaken by BIBB (Federal Institute for Vocational Education) and IAB (Institute for Labour Market and Employment Research) are not detailed enough or do not allow for a time series analysis. However, a recent representative employer survey investigating amongst other issues the substitution of *Meisters* (Plicht, 2000) is expected to throw some light

on the key issues of this project. Qualitative studies focusing on the substitution of *Meisters* by engineers are virtually non-existent. Only a study by Jauch (1997) touched upon this issue.

Due to the lack of information at the start of the study, the investigation needed to be exploratory, mainly employing qualitative research methods. However, it is also acknowledged that this study has its own limitations. First, the project focuses only on companies in the old *Laender* as too many differences exist between the old western and the new eastern *Laender* with regard to the matter under investigation. Second, due to the lack of information it is not known whether the three companies covered are representative of all the companies pursuing a substitution policy.

In the following, an overview on the development of *Meister* positions in industry, the formal qualifications of those holding a *Meister* position and their typical education and career patterns will be given. This will be supplemented by quantitative data on the substitution of *Meisters* by engineers. Case study findings focusing on the forms, aims, consequences and future perspectives of the substitution policy will then be presented. Finally the inter-relationships between the German education system and substitution policies adopted by companies will be discussed.

4.2 The traditional education and career patterns of *Meister*

4.2.1 An overview of the dual system and continuing education relevant for career progression

Continuing education leading to a *Meister* qualification is firmly rooted in the dual system. In order to embark on a *Meister* course, two to three years of relevant work experience is required after having successfully completed an apprenticeship lasting between two and three and a half years. Those without a relevant apprenticeship can also be admitted, if they have acquired seven years of work experience in the area in which they want to become a *Meister*. Formal qualifications are therefore, strictly speaking, unnecessary in accessing *Meister* courses, yet in practice those with higher formal qualifications are more likely to embark on these continuing education courses. Traditionally, courses leading to a *Meister* qualification play an important role in people's educational decisions. According to representative data gathered in 1991/92, 24 per cent embarked on further education and training after completion of an apprenticeship and most of them actually entered *Meister* or technician courses (Bausch and Jansen, 1998). Participation in further education and training differs by sector of employment and company size.

4.2.2 The classic path to a *Meister* position

The term *Meister* relates to two different groups: those holding a *Meister* position irrespective of whether they have a *Meister* qualification ('status *Meister*') and those having qualified as a *Meister*, irrespective of whether or not they are employed as *Meisters*. According to statistics, 124,000 were holding a *Meister* position in 1998 (Statistisches Bundesamt, 1999) and 1.53 million, living in the old *Laender*, had a *Meister* qualification in 1991/92 (Bausch and Jansen, 1998). Most of them had qualified as a *Meister* in trade rather than as a *Meister* in industry. The latter data also revealed that only about two thirds of those holding a *Meister* position actually had a *Meister* qualification in 1991/92. Yet more recent studies indicate that this figure seems to be outdated as more post holders are expected to have a *Meister* qualification

nowadays. Career paths leading to a *Meister* position have changed dramatically. It still holds true that career paths predominantly start at the bottom of the hierarchy, yet the level of formal qualification and further education required for a *Meister* position has increased. The situation is fairly similar for the position of a foreman, commonly regarded as a stepping stone for a *Meister* position.

4.2.3 The development of further education leading to an industry *Meister* qualification and its function for embarking on management positions

The volume of industry *Meister* courses has risen sharply in the past fifteen to twenty years, contrasting with a massive drop in the number of *Meister* positions due to the introduction of lean management and teamwork. The increase of industry *Meister* courses is mainly due to three factors. First, a *Meister* qualification has virtually become a necessary requirement for promotion to a *Meister* position. Second, following company rationalisations, early retirements have opened up new promotion opportunities for younger workers and, third, the education system had a vested interest in increasing its market share. Companies were supportive of the further education aspirations of their workers, as they wanted to retain qualified workers by giving them an opportunity to achieve higher qualifications. Furthermore, previously generous public support made it easier for companies to offer such opportunities.

The rise in people qualified to *Meister* level and the fall in available positions finally led to a market imbalance with the consequence that some *Meisters* were actually denied the promotion for which they were hoping. According to data gathered in 1991/92 most workers with a *Meister* qualification had actually been employed as *Meisters* or they were holding other qualified or even higher level positions. Yet one fifth of workers with a *Meister* qualification were working as skilled workers or at an even lower level (Bausch and Jansen, 1998).

Since the beginning of the 1990s the number of people successfully completing a *Meister* course has dropped sharply. The massive reduction of public funding contributed to this development as well as individuals' assessment that their chances of promotion to a *Meister* position had deteriorated significantly. According to some representatives from education institutions people now see the course rather as a means to secure their job at the current level rather than to get promotion (Jaudas and Drexel, 1997), which in turn has an impact on the function of further education itself.

In the last couple of years the number of people qualified to *Meister* level has increased relative to the number of *Meister* positions. This in turn has left some workers holding a *Meister*'s qualification in positions below *Meister* level, particularly in large companies in mechanical engineering and car production. Relatively little is known about how companies assess the surplus of people holding a *Meister* position in relation to the number of *Meister* positions. One study revealed that companies do not have a problem with this development (Drexel and Jaudas, 1997). Yet companies acknowledge that opportunities for promotion might be blocked permanently for this group, not least because the qualifications become outdated if they cannot be applied to the position for which they were designed. Systematic personnel policies to attempt to remedy this situation appear to be non existent.

The issue is hardly discussed by the general public either and there are only few proposed solutions to the problem of blocked career paths for holders of a *Meister*

qualification. One of them is a newly established further education course, leading to qualification as a technical management expert (*Technischer Betriebswirt*), for those already qualified as *Meisters*. These courses seem to have attracted a good number of participants. Another way out of the cul-de-sac could be for those blocked individuals to study for a degree course at a higher education institution. This route has only relatively recently been opened up for experienced workers with intermediate formal qualifications. Yet, so far few have actually embarked on this endeavour.

4.2.4 *Meisters* pay

The majority of *Meisters* are paid according to fixed rates for salaries. In most economic sectors separate salary scales for *Meisters* exist with 4-5 salary brackets, depending on the region in which the pay agreement was achieved. In the metal industry in Schleswig-Holstein, for example, the initial pay ranges from 3.314 DM in the lowest band to DM 5.745 in the highest band (figures valid for November 1995). Yet the differentiation between the pay groups appears not to be clear-cut. In the chemical industry skill demands, seniority and experience are relevant in determining the salary bracket. However, it has to be said that the pay scales do not fully reflect the take-home pay of *Meisters* as they are quite often paid high salary bonuses. The actual net earnings for all *Meisters*, irrespective of the sector of economic activity, show great variation.

4.3 An overview of the substitution of *Meisters* by engineers

The relation between qualification levels and hierarchy levels in employment organisations was relatively close in the past. For a long time this was regarded as an indicator for the potential of the German education system to provide a sufficient basis for adapting to far-reaching changes in skill demands occurring in a person's working life. The recruitment of more highly qualified people for the appropriate hierarchical level was thus not deemed necessary. Yet this relationship has changed in the past one or two decades due to increasing unemployment rates and the concurrent increase in the number of highly skilled people. Initially, young skilled workers were under-employed as semi-skilled workers. Yet recently engineers and *Meisters* have also been affected by underemployment. Figures for the beginning of the 1990s still indicated that there was no substantial substitution of *Meisters* by engineers (Bausch and Jansen 1998): in industry 2 per cent of (FH) engineers were employed in *Meister* positions and 1 per cent of *Meister* positions were held by (FH) engineers. But in the meantime changes have taken place that may have affected the volume of substitution.

A recent representative employer survey (Plicht, 2000), covering companies with more than 20 employees, shows that the volume of substitution of *Meisters* for engineers has indeed increased, although only slightly. In 1998, just 5 per cent of all junior production management positions were filled by engineers. This proportion is expected to increase in the long run, if the current recruitment intentions of companies are to be realised. According to the survey, overall more than one in five companies have recruited engineers for *Meister* positions. Substitution is more likely to take place in large companies. The study also showed that companies planning to introduce teamwork were slightly more likely to employ more engineers in *Meister* positions than other companies (Plicht, 2000).

These quantitative studies provide an overview on the volume of engineers employed in *Meister* positions in the 1990s, but they leave a range of questions unanswered. These relate to the forms of substitution, the basic conditions and the company goals associated with the substitution policy as well as the consequences and the resultant problems of this policy. It is these issues that have been the focus of this qualitative investigation adopting a case study research method. The investigation centred on three case studies, two conducted in mechanical engineering companies and one in a pharmaceutical company.

4.4 Forms, aims, consequences and future perspectives of the substitution policy under investigation - a summative analysis

4.4.1. Forms of substitution

The three companies have adopted different forms of substitution policy, indicating more or less a dramatic change in their recruitment and selection policies. The study revealed various forms of a gradual substitution of graduate engineers: substitution takes place in cases of more or less natural wastage or job changes and in cases of the introduction of newly tailored management positions in production. Only one company employs young engineers straight after their graduation in *Meister* positions, whereas the other two companies expect the engineers to have worked for the company in a relevant position. Substitution policy is always accompanied by the introduction of new 'modern' labels for the management position in question. One company has used the term 'coach', a label that seems to have spread fast in German industry. The new labels are supposed to symbolise and legitimate the new policy, and most of all help the new policy to gain acceptance.

Parallel to the introduction of new recruitment and selection policies and the new labels, various changes in hierarchy, work organisation and the job profiles of different management positions have been implemented. In all three cases some former tasks of the *Meisters* have been delegated to people at a lower hierarchical level, either to teams of workers or to staff filling newly created intermediary level positions. The newly labelled management position carries (considerably) more responsibilities in two cases, in one of them the *Meister* level was completely abolished in favour of a new far more senior position. In the other case, where the company established a new coach position, the responsibilities have hardly changed. In future, two companies want to recruit only engineers in (former) *Meister* positions, yet in exceptional cases workers with a high-quality further education background could be given a chance. In the other company personnel managers have opted for a mixed recruitment strategy even though some of their production managers were in favour of employing engineers exclusively.

To summarise, the substitution of *Meisters* by engineers has happened only gradually as far as numbers are concerned. Yet there are some dramatic changes in many other respects: the labels of the positions have been altered in all three case study companies, and in two instances this has coincided with increased responsibilities. Job experience and seniority as a consequence have at least in part been significantly devalued as criteria for promotion. Change will become even more apparent in future as it is expected that more engineers will replace the traditionally qualified as *Meisters*. The different profiles of the substitution policies need to be understood

against the backdrop of the basic conditions and the underlying aims of companies implementing these policies.

4.4.2 Basic conditions and aims of company substitution policies

The first basic condition to be met in order to implement a substitution policy is a plentiful supply of engineers in general, but partly also a specific local supply of young qualified engineers or an internal supply of engineers. The availability of engineers facilitates the implementation of a substitution policy, but it cannot fully explain it, as the companies under investigation could have carried on appointing traditionally qualified *Meisters* as many other German corporations continued to do. Rather a number of other conditions are also influential in the establishment of new recruitment and selection policies. All three companies were facing economic crises resulting in reductions in employment levels. One company was forced to lay off significant numbers of staff at the beginning of the 1990s and the second company initially planned to shut down the whole production process. There was less pressure in the third company to lay off staff, but the integration of specialist staff had caused some turbulence in employment levels. These pressures have not in all cases determined the precise forms of reorganisation of company structures and policies, yet they have been instrumental in facilitating the initial development of plans for far-reaching changes and have created a climate more conducive to change.

New forms of work organisation, especially lean management and teamwork, are often cited as factors that help explain the introduction of new recruitment and selection policies. Again these factors played a role in the three companies covered, but they cannot fully explain why the new policies were adopted. In two cases the new recruitment and selection policies had been introduced in the course of establishing teamwork and the number of levels in the hierarchy had been reduced. Yet this does not necessarily imply the elimination of the key role *Meisters* play in the organisation of production as the cases of many other German companies having adopted different solutions show. Furthermore, one of these companies initially planned to abolish the management level above the *Meister* level, before it was finally decided to eliminate the latter. In the third case teamwork was only partially introduced after new recruitment and selection policies had been put in place and the number of hierarchical levels had risen from three to five. However, there does seem to be a connection between substitution policy and integration of specialist staff into production, as two companies argued. This seems plausible, as it would indeed be difficult for *Meisters* to supervise specialist staff, primarily on status grounds, but perhaps also due to technical reasons.

Increasing skill demands and insufficient skills of traditionally qualified *Meisters* are another frequently cited reason for the introduction of substitution policies. In all three cases studied, the qualifications of *Meisters* were relatively heterogeneous, comprising *Meisters* with and without relevant formal qualifications. Older *Meisters* lacking these qualifications were particularly vulnerable, yet other companies have found solutions other than substituting *Meisters* by engineers, such as early retirement of the older *Meisters*, coupled with rejuvenation of that level of the workforce by appointment of younger traditionally qualified *Meisters* and/or retraining of the remainder. Such strategies would have been possible in all three cases, but they were rejected or not considered.

This implies that factors other than those already mentioned must be operating in favour of the introduction of a substitution policy, such as specific constellations of staff within the company. In one case the decision to employ engineers in former *Meister* positions, that had hardly undergone any changes, was essentially the result of an unplanned development and its unintended consequences. Many *Meisters* were looking for early retirement or jobs elsewhere in view of the impending shut down. Engineers were called in on a temporary basis to fill the gap, but when the decision to relocate production was reversed, even more engineers were recruited permanently in former *Meister* positions. The fact that nothing was done to help re-establish the traditional *Meister* path indicates that vested interests of the company were at work.

In the second case the affiliation and increase of specialist staff positions in the 1990s eventually led to a policy favouring a higher share of graduates being employed in general and in production in particular, with the avowed intention of bringing specialist staff positions closer to the production. In the third case the hierarchical level above the *Meisters*, traditionally filled with engineers, was due to be abolished following the introduction of lean management. In the end, the executives decided to eliminate the *Meister* level, as this promised to save a much bigger share of personnel costs at a time when the company was facing an economic crisis. Yet again, vested interests of the company played a key role in taking this decision.

Political factors have also contributed to the introduction of substitution policies. It could be argued that companies have a vested interest in increasing the share of graduates at management level as this still allows them to offer promotions to such staff in lean management organisations. Furthermore, senior management may hope that the employment of graduates at junior management level will raise the status of the middle and upper management. But perhaps most important in their drive to recruit more graduates, is the more or less clearly articulated interest in breaking the power the *Meisters* traditionally had. Instead of having to rely on the tacit knowledge of *Meisters* in controlling production and personnel, companies now want to create more transparency using quality control and production planning and control. Ultimately, it could be argued that this could result ‘in the abolition of the entire cardre of *Meisters*’. Coming at this from a different angle, one company argued that they would like to widen access to *Meister* positions to those with qualifications other than a *Meister*, in order to allow more scope for selecting someone with a personality suitable for the job.

That these substitution policies succeeded is remarkable in view of the power *Meisters* still had until a couple of years ago. As far as these processes can be explained ex post, three factors have contributed to this development. First, there were divisions within the group, due to the divergent interests of *Meisters* in the face of the threat of redundancy. Second, company policies explicitly aimed at segmentation, breaking the solidarity of a group of *Meisters* by offering them good (employment) conditions. Third, the group was relatively passive, as there was a lack of a common offensive strategy on part of the *Meisters* and the factory committee.

4.4.3 Consequences and possible problems resulting from substitution policies

Consequences and problems for the employee groups concerned

The new policy brought painful experiences to *Meisters* staying with the company in all three cases covered. The feeling of devaluation was particularly strong in one

company that required a *Meister* qualification for those working at the hierarchical level below the *Meister* level, without giving these workers the status of salaried employees. It was not the pay that caused the shock, as protection of vested rights were put in place, but the loss of the position and the function as well as the feeling of betrayal of loyalty on the part of the company. Depending on their personality, *Meisters* either resigned or worked to contract. The bitterness was greatest in those cases where *Meisters* were actually brought in again to compensate for the deficits the new solution produced. Those who looked for jobs elsewhere found it difficult due to the labour market situation. Therefore, most *Meisters* tried to stay with the company in the hope of being able to retire as soon as possible.

The occupational fate of the *Meisters* was very different in the three companies covered. In one case it was left to the *Meisters* themselves to look for other jobs, for example in one of the specialist staff departments or in the maintenance department. Another company created for those few *Meisters* concerned a new position that seemed to resemble more a new label than a clearly defined position. Only one company had established new positions and career paths for some of the *Meisters* who had lost their jobs. One new position is nearly equivalent to a *Meister* position with responsibilities primarily in technical reorganisation and personnel management of workers. The other position, a senior advisor, was created as it emerged that those holding the newly created senior positions, who were primarily engineers, could not cope with the full range of their responsibilities. Two or three senior advisors were allocated to such a senior position in order to assist in case of technical problems and to facilitate communication between managers and workers. Some *Meisters*, as a matter of fact, had continued with a good proportion of their earlier tasks without having the power and the status that went with the post previously. *Meisters* realised that the formal and informal structures had drifted apart and criticised the lack of workability of the new formal structure. The company hopes that the senior advisors are going to be an interim solution, which, in the medium term, may avoid the establishment of a new management level. Apart from the senior advisors another semi-formal hierarchical level emerged following the introduction of lean management and the substitution policy: the spokesperson of the team, who was to service not to supervise the team, has actually become a mini-*Meister*.

It is evident that the employment of engineers as industrial supervisors limits promotion opportunities for workers in general. Depending on the qualification structure of the workforce in production and previous traditions, the loss of promotion opportunities has had different effects. The new policy had little impact in one company with a less highly qualified workforce and little history of internal promotion. The situation was different in another company where workers now need a *Meister* qualification to be considered for promotion to a post which carries less status than the previous *Meister* position, thus causing a great deal of frustration. In the third company, where the *Meister* level has been completely abolished, workers have reduced their commitment to further education or they might embark just on a technician course, knowing that they can now only get as far as being a spokesperson for their team.

But even engineers, who seemed to have benefited from the substitution policy, had to face ambivalent and partly problematic consequences. As their main responsibilities cover organisation and personnel management, they feared for the gradual devaluation

of their technical qualifications, which were essential if they were to move on to engineering jobs. A job at (former) *Meister* level only seemed acceptable as an interim stage on the way to more senior management positions. Yet chances of getting promoted to a higher level position are not very good, leaving engineers with little alternative other than moving on to specialist staff positions. Another reason for the turnover of engineers related to the difficulties they experienced at work. Engineers in all three companies realised that they had deficits in technical and social skills, particularly in comparison to traditional *Meisters*. Even engineers who had worked for the company before did not find themselves well prepared for this kind of job, as they did not have much contact with production in their previous jobs. Most difficulties were experienced in the company that had reduced the number of hierarchical levels only to re-introduce a temporary informal hierarchical level to counteract the skill deficits of the engineers.

Consequences and problems of the new substitution policies for the companies
The new substitution policies also had problematic effects for the companies. At a general level the upheavals affected the trust some employees felt in the company as a result of the previously powerful *Meisters* being marginalised. More specifically, former *Meisters* have reduced their commitment to the company, and younger workers felt disappointed that the *Meister* qualification they had acquired was no longer likely to serve as a passport to junior management positions, thus negatively impacting on the desire of others to strive for further education. Furthermore, the spokesperson of the team has been a reduced to a mini-*Meister*, considerably hampering the full implementation of the concept of teamwork. Substituting *Meisters* by engineers also meant the loss of experience and knowledge as *Meisters* have left the company or have moved on to different jobs internally.

The turnover of engineers, due to the reasons mentioned above, also prevents the accumulation of experience in junior management positions and the stabilisation of the relationship between workers and their managers. But most of all, the skill deficits of the engineers may lead to problems in controlling the technical part of the production process and deficits in communications skills may lead to problems when dealing with issues concerned with personnel counselling. Overall, it seems quite likely that the employment of engineers in junior management positions may favour the re-introduction of Taylorism, which was supposed to be overcome by adopting a teamwork approach. This is because it is the skill deficits of engineers holding junior management positions, that in turn requires a more transparent and less complex production process, that results in the need for more Tayloritistic structures and bureaucratic supervision.

These skills deficits cannot be entirely remedied by recruiting engineers who have worked with the company as specialist staff, because these people would still be short of the relevant leadership and production experience pertinent to the job. Offering engineers the opportunity to develop their leadership skills in positions below the *Meister* level may also backfire, as the experiences of one company revealed. These positions will become less attractive for the candidates previously appointed to these jobs, and the turnover in these posts as engineers move on could also have possible negative impacts on the overall system. Furthermore, substituting *Meisters* by engineers has created a growing distance in the working relationship between workers and production managers. *Meisters* have always been in touch with the workers and

have been approachable for workers, whereas engineers focus more on their desk work, partly because they are less experienced in tackling the technical or personal problems workers may have. Workers, on the other hand, complain about the know-all manner of their managers.

4.4.4 Future perspectives on the new recruitment and selection policies

Companies have been able to achieve their economic and political goals by substituting *Meisters* by engineers, but it is an open question as yet, whether they will continue pursuing the new recruitment and selection policies in view of the various resulting problems delineated above. However, it seems likely that it will be very difficult for companies to change their policies, should they see reasons for doing so in future, as the following cases show.

One company, for example, pleaded for a co-existence of *Meisters* and engineers in coach positions, but it did not actively support workers without a degree in their career development. Yet, with every new engineer appointed as a coach workers will lose faith in the value of the *Meister* qualification, as it is no longer viewed as a means to helping them to get promotion. Furthermore, the gradual increase in graduates may eventually mean that existing production methods give way to more Tayloristic structures. In another case, the decision of the management to give only exceptionally capable workers with a *Meister* qualification a chance to be promoted simply deters workers from striving to get the qualification in the first place. While the third case showed that far-reaching changes in the organisational structure cannot be reversed without provoking resistance of all the groups in the workforce concerned.

4.5 The connections between the German education system and substitution policies being pursued by companies

4.5.1. Deficits and new developments in the education system as one cause of the development of substitution policies?

What about the argument, advanced by for example Frieling (1998), that substitution policies have spread due to deficits in the skills, knowledge and understanding of supervisors holding *Meister* qualifications? It needs to be recalled, though, that qualification levels of those employed in *Meister* positions have risen in the last two decades (Plicht, 2000), which was offered as one explanation why substitution of *Meisters* for engineers has remained at a relatively low level. In none of the three cases studied was the criticism of *Meister* education a central issue. However, one can assume that the heterogeneity of *Meisters* in terms of their qualifications, facilitated the substitution policy, but did not entail it. The company could have introduced alternative measures, such as sending *Meisters* on training courses or substituting older, less qualified holders of *Meister* positions for better qualified younger ones. Engineers may indeed offer better qualifications and skills than *Meisters*, but in most cases these are not central to the (reformed) roles of *Meisters*; an exception are IT skills, yet they are acquired in the course of further education or nowadays even in the course of initial education.

However, it became apparent that there is a structural gap in the education system. There are hardly any courses that offer the acquisition of leadership and production experience and at the same time a qualification equivalent to the status of a graduate degree. Yet it is this type of qualification that will be required in view of the

increasing trend to marry production and specialist staff with employment of a high proportion of graduates. One solution could be the further development of courses, such as those for technical management experts (*Technischer Betriebswirt*), which build upon the achievements of those holding intermediate qualifications.

The surplus of engineers facilitated the new recruitment and selection policies. In that sense, one could, at least, talk about quantitative imbalances between the demand for engineers in part of the labour market and the educational activities of the education system. Researchers, such as Frieling (1998), and companies partly argue that the substitution policy follows the changing structure of qualifications. However, this argument conceals two facts. First, companies are not forced to adapt to the new structure of qualifications; it is rather specific constellations of staff in companies and their vested interests, which pave the way for the new recruitment and selection policies. Second, the change in structure of qualifications is no law of nature; it is partly influenced by employers' recruitment and selection strategies.

4.5.2. Possible consequences of substitution policies for the German education system

If substitution of *Meisters* by engineers increases, its impact on the education system is likely to be substantial. First, workers will either reduce their further education activities or embark on courses opening up more attractive careers, as the case studies have already shown. Furthermore, the function of the *Meister* qualification has changed, as it has now become a prerequisite for more demanding skilled worker jobs and, in the case of mass redundancies, for helping an individual to keep his or her job. Second, education and training in the dual system will become less desirable and higher education even more attractive if it is engineers and not *Meisters* who are being employed as industrial supervisors. The diversion of more young people into higher education may also have negative consequences (Drexel, 1999).

A third - and hardly discussed - consequence of the substitution policy is the devaluation of the engineering degree in the labour market, a development which could result in fewer numbers of young people studying for that degree. This development is reinforced by recruitment strategies of companies, initially employing engineers below the production management level in order to allow for the acquisition of necessary production experience. And finally, it is to be expected that industry will criticise higher education institutions even more for being too theoretical. Small reforms that have addressed this criticism are not really an adequate answer to the problems resulting from the implementation of substitution policies. Although the students gain practical experience, this is still too superficial. Furthermore, the availability of practically educated graduates facilitates the spreading of the substitution policy - without being able to offer solutions for the consequent problems it causes.

5. New pathways leading to supervisory positions in industry: an overview on the situation in the United Kingdom

5.1 Changes in the training, qualifications and backgrounds of industrial supervisors

The collapse of firm-based intermediate skills education and training in many sectors up to the early 1990s reinforced the historic weakness of the UK intermediate skills base (Prais and Beadle, 1991) and undermined efforts to upgrade the training and qualifications of supervisors. At that time there was a recognition of the inadequacies of much supervisory training, and that the dominant function for many supervisors was progress-chasing (CBI, 1992a, b). Additionally, there was the massive contraction of manufacturing industry in terms of numbers of people employed over the final two decades of the twentieth century. All these factors combined, with an industrial structure that made greater use of semi-skilled rather than skilled workers, to ensure that the pool of well-qualified skilled workers with the abilities to become effective supervisors was relatively small.

However, Rolfe et al (1994) showed that progression patterns for supervisors vary greatly between industries: for example, with very big differences between chemical and engineering industries in terms of previous occupational background and qualifications levels. For most supervisory appointments, personal qualities were seen as more important than formal qualifications, and traditionally supervisors were likely to be recruited from the groups they supervised. Furthermore, 'traditional' supervisors' roles could encompass great variation in their duties and responsibilities. Supervisors have been identified with a range of possible functions: technical, managerial and instructional (or pedagogic). As they are likely to have acquired their position through a process of development in which their competencies have been affirmed, they could sometimes be seen as role models and socialisation agents within the organisation. The German model balances the pedagogical, technical, managerial, and social dimensions. British developments have in the past tended to emphasise technical and/or managerial aspects of the 'supervisor's role'. Such broad generalities mask important differences, particularly in the British context where diversity now abounds, particularly in relation to the training function. However, in the recent past one of the striking aspects of the traditional role of the industrial supervisor was its relative lack of engagement with the training function.

Training was seldom seen as a core function by 'old style' supervisors. This was in full accord with employers' cultural and historical resistance to investment in training that characterised British industry in the recent past (Brown and Evans, 1994). This contrasts with the present where some companies now take a more active interest in training. For example, supervisors can now have explicit training responsibilities, but training functions could also be undertaken by staff styled as mentors, cell leaders, coaches, or key operators, with different duties emphasised. The role and the amount of responsibility for training others could vary according to the type and size of company, management style, and whether the industry was traditional or modern. The last ten years have seen the supervisors' weak indeterminate position being resolved in many contexts, often as part of or, as a consequence of, changing patterns of work organisation.

The attempt to upgrade the training and qualifications of supervisors through the adoption of *Meister* type supervisory qualifications in the UK in the 1980s had sought to improve both the technical competence and training capability of supervisors. However, 'poaching' of workers successfully completing the scheme undermined the scheme. At the same time budgets for external training were being cut, and this was putting the squeeze on externally funded courses such as the CGLI Master Series that took two and a half years to complete. As a consequence companies involved in the scheme made greater use of the much shorter, less technical and more generic NEBS supervisory courses instead to upgrade its supervisors. NEBS courses develop skills in people management, training and testing competencies, but they do not involve any technical project work, and are much shorter (involving only a year of one-day a week day-release). The experiment of seeking to develop further craft or technical competence as a key component of a technical supervisory qualification for skilled workers, broadly following the German model, therefore came to an end.

However, there are programmes within higher education that seek to achieve broadly similar aims in developing technical competence alongside supervisory or managerial abilities. A number of full-time degree programmes, as well as part-time ones, are very strongly work-based, and include substantive placements in industry where the students engaged in real work. Where these graduates are employed they are often replacing supervisors or junior managers with few substantive technical and supervisory qualifications: the people occupying these positions previously rarely had either type of qualification, typically they 'muddled through', engaging in 'fire fighting' activities. Although there may be a superficial similarity, this 'substitution' process is not in a substantive way directly comparable to the German one, where highly trained traditional supervisors, with strong technical training and supervisory qualifications, and considerable work experience, are replaced by highly qualified, technically competent, but relatively inexperienced graduates. Indeed in some cases in the UK the balance of advantage was heavily weighted in favour of employment of graduates, if the company intended to move away from the traditional strategy of mainly relying upon competition on price, with lower quality, cheaper products.

It was precisely because the CGLI Masters schemes did represent a predominantly work-based attempt to strengthen intermediate skills development that they are of comparative interest. The value of the CGLI Masters schemes was that they were explicitly designed to develop human resource management, technical and planning skills. They were intended as a strategic response to the underdevelopment of the supervisor's role. However, as the subsequent NEDC report (NEDC, 1991) made clear the problem remained. Why did the Masters schemes have so little impact, when they were almost universally regarded as fulfilling a crucial need? For the CGLI Gauge and Toolmaking Masters qualification ironically the breadth of skills developed did result in individual progression for many of those in the early cohorts. However, this often involved a switch of employers and this proved a disappointment to the companies, who saw valuable staff 'poached'. Also the key skills were perceived as ones relating to traditional first line management. That is, individuals might get jobs with the same strategic responsibility for organisation of work as German Meister, but there was no corresponding responsibility for oversight of the training for staff, especially apprentices. The lack of a work-based training infrastructure simply meant that within their ambit of work neither the supervisors nor those they worked with would have training as a significant work activity.

To be successful then, for more than isolated individuals, the schemes required an organisational commitment from companies themselves to support the development of the staff both during and after their time on the scheme. Brown et al (1994) showed that one of their case-study companies did try to use the scheme as one tool in just such an approach (significantly it was after a visit to a comparable German factory and viewing their training!). They convinced significant numbers of former apprentices to continue their development and take a Master qualification. The problem though was that they could not accommodate such numbers within internal progression routes, and once again opportunities to exercise the coaching expertise were limited within the existing structure of work. From the above it is clear that the patterning and organisation of work can constrain the impact a new qualification has in practice if there are only limited opportunities for the qualified to progress their careers.

While the attempt to introduce a stronger technical dimension to supervisory qualifications failed the more traditional supervisory qualifications were rejuvenated, with a step change in the number of enrolments from 1987. The major factor behind this was the surge in the numbers taking short introductory awards that usually lasted for five days. Changes to supervisory roles, however, have to be seen in their organisational context and, in particular, related to changes in the overall patterns of work organisation. Where organisations have opted to introduce major changes to patterns of work organisation, some have chosen to strengthen the supervisory role while others have opted to abolish the role altogether, preferring instead to rely mainly upon team leaders (Wright and Edwards, 1998).

One of the difficulties in deciding whether there is an enhanced role for first line supervision in new forms of work organisation is linked to the nature and extent of duties of team leaders. In some areas and forms of work organisation, team leaders may have less responsibility in relation to control of production and discipline than 'old style' supervisors, but in other areas such as training they may actually have a much wider set of responsibilities. For example, the main training tasks and activities of team leaders could include:

- taking an overview of team training within the company goals;
- co-ordinating team training (in liaison with training managers);
- managing programmes of individual trainees assigned to the team;
- designing individual training programmes if required;
- delegating specific project or task training to other workers;
- undertaking direct training if required (Brown et al, 1994).

There are a range of strategic options available to organisations in how they treat the role of supervisors in new forms of work organisation and the tactical possibilities open to management in the type of people they wish to recruit to intermediate roles in their companies. What is interesting in a European context is how this debate has been almost entirely framed within a managerial discourse about the need for new patterns of work to respond to changes in the external environment. That it is it has been seen almost exclusively as an implementation issue rather than a topic for discussion and debate where there may be a range of competing perspectives. The collapse of craft training, the weakness of the trade unions (and the supremacy of the interests of

general workers rather than craft specialists) and the lack of a tradition of social partnership meant that countervailing views were seldom expressed.

Indeed the shrinkage of the manufacturing base and continuing high profile plant closures and job losses meant that there was in the main acceptance of the need to move to new patterns of work organisation. Further it was generally seen as the responsibility of management to devise an implementation strategy. There may be consultation or negotiation over the details but the discourse rarely extended to any challenge to the right of management to control the definition and utilisation of skill in their particular organisational contexts. Indeed a number of companies made it explicit that workers were to carry out work for the organisation, rather than being employed as and being expected to work in a single occupational setting. Multi-skilling and a willingness to work across occupational boundaries were accepted in many contexts. Skilled workers acquiesced to these changes, other workers in some cases welcomed their expanded role, and the views of supervisors and junior managers were often given scant attention in plans for organisational restructuring. This meant that senior managers in companies when making strategic choices about the possibilities of restructuring the organisation of work were seldom constrained by conceptions of other groups about appropriate career pathways. On the other hand, they may have felt constrained by the nature of their existing skill mix, the availability of different types of labour and so on.

The availability of graduate labour to fill intermediate level jobs has become increasingly important over time, but even in the early 1990s, Rolfe et al (1994) found that "the increasing use of graduates at intermediate level, because of plentiful supply, created additional flexibility for companies but also some problems. As well as reducing opportunities at intermediate level for non-graduates, the graduates themselves could become demotivated if retained too long at intermediate level. Movement above intermediate level (that is, into management or professional levels) was subject to severe 'bottle-necks' and was rare except for graduates" (p xiii). The use of graduates at intermediate level though is not just because of plentiful supply, but also because of a dearth of others with the requisite skills. Steedman (1990) highlighted the way in the engineering industry that graduates and technicians have been 'drawn down' by the inadequacy of skills at intermediate level. Rolfe et al (1994) emphasised that 'working downwards' was particularly evident for graduates working in laboratories in chemicals companies.

Graduates working at intermediate level "were considerably more likely to progress to management positions and at a much faster rate than non-graduates. The discrepancy between the prospects of graduates and non-graduates was most evident where companies operated a graduate entry scheme. Here, it was usual for recruits to begin at intermediate level, or even lower, and to receive intensive internal and job training for management positions" (Rolfe et al, 1994, p26). Graduate training programmes often included gaining practical experience at lower levels, although "the length of time spent by graduates at intermediate level was sometimes extended beyond that required for training" (Rolfe et al, 1994, p37). Graduate demand was driven by "the perceived superior leadership qualities and decision-making skills of graduates; the increased knowledge requirement at management level and the financial advantages of recruiting employees already equipped with much of the knowledge and the ease

with which graduates could be recruited in comparison with employees qualified to BTEC higher level" (Rolfe et al, 1994, p26).

5.2 Contexts and strategies for changes in supervisory roles in the case study organisations

5.2.1 CASE STUDY – UK CHEMICALS

The UK oil and chemical company case study plant produced industrial chemicals using process technology that meant the plants operated continuously for two to three years before maintenance shutdowns were implemented. Currently there are approximately 1,200 company employees on site, with, at any one time, about 100 agency workers and between 200 and 600 contractors. The plant works a continuous 6 shift system and has recently undergone significant organisational restructuring with the introduction of self-managed teams, with team-leaders taking over some but not all of the supervisory functions. The size of the teams varies according to the requirements of the task, although eight is considered to be the maximum for a team to be viable. Under the new system, four Day Performance Engineers each have six shift teams, within which a Team Leader operates. In the operational areas, there are approximately 85 Team Leaders in total, and 18 Manufacturing Performance Engineers.

The creation of the Team Leader (TL) role is still relatively new, and there is some degree of uncertainty about what the job entails and what areas of responsibility are embraced. Team Leaders have no formal accountability role for 'soft' issues such as appraisal. The Team Leaders perform the role of principal team coach, and are chosen for their skills and knowledge. They are responsible for ensuring that things happen in order for the team to achieve competency, especially related to Health and Safety requirements. However, the overall responsibility is built into the team performance contract. Each team has performance targets based on the plant's business performance targets. These team performance targets are made up of team targets, with, crucially, a shift in emphasis from the individual to the team. Accordingly, reward and recognition are bestowed on the team rather than the individual.

Whereas traditional supervisors had managed their teams, TLs now have no such managerial function, and many of the supervisory skills had been taken away. They no longer have responsibility for getting the teams to get things done or for disciplinary matters, and, while they retain some management functions, it is less apparent than in the days of the supervisor and is not imposed in the same way. The TLs still perform their technical tasks when they are not doing their paperwork or undertaking the day-to-day running of the shift. There is an expectation of a perceptible shift in the style in which the Team Leader manages, with a break from the tradition that the supervisor would tell people what to do. One area where the TLs have particular responsibility is in training. Some former supervisors who became Team Leaders have tended to 'fall back' into their traditional 'control and command' modes of operation.

As far as the teams are concerned, the Team Leader is seen more as a technician than as a supervisor. This is because they are still regularly involved in the tasks they formerly performed as technicians. At present, the TL is responsible for making any decisions that have to be taken, although there is recognition that in future more of the

decisions will be made collectively by the self-managed teams. This process is beginning, with TLs involving the team in discussions about responses to issues. A major responsibility of the TL is the completion of paperwork relating to the whole team. Examples of this are the writing of updated technician training programmes, and the issuing of 'permits to work' – the process has always been that only supervisors, or latterly TLs, can be designated signatories for these permits, and for a whole raft of other authorisations.

Whereas previously there was a policy of separation, whereby anyone being promoted to supervisor would automatically be moved to another shift, so that they were in charge of a set of workers with whom they had not worked before, it was decided to appoint Team Leaders from within the team. This was to allow them to continue to work with that team, and in their new role the intention was that they should be regarded as the 'first among equals'. A crucial aspect of the current policy is that it represents a desire to move away from an emphasis on 'control' to an emphasis on the 'empowering' of individuals and accountability to the team. The biggest change has been that, whereas supervisors used to be recruited because of their ability to control and command their teams, a different role is now required. Formerly, the culture was related to information/power, and supervisors could be selective in terms of what information they chose to transfer.

In terms of future career aspirations, there is now a considerable gulf between the position of Team Leader and that of Day Performance Engineer. Of the present Team Leaders, only those with higher level qualifications, such as a degree, coupled with relevant experience, would be likely to have a realistic chance of making such a transition.

The greatest challenge for the company in implementing the new self-managed team system is perceived to be in incorporating individuals who had previously been supervisors into Team Leader positions. In the relatively short time since the introduction of the self-managed team system and Team Leaders, all those supervisors who had a desire to leave the company have done so. These tended to be the traditional type of supervisor, operating with a 'command and control' ethos, rather than the 'newer' ones who espouse the 'empowering/coaching' philosophies that are being implemented. Of those who are still with the company, many have been 'promoted', or at least moved from their former jobs. There was a consensus that, in the course of the phasing out of supervisors' posts, many had become disillusioned and demotivated.

One of the Team Leaders interviewed was a graduate chemist, although, when he joined the company twelve years previously it had been as a technician. This had been a difficult move, because he had been rejected for the process plant, on the grounds of being over-qualified for such a job. His fellow workers were all time-served tradesmen, but he had always felt that having a degree set him apart from the rest. He became a full-time supervisor, and, subsequently, a Team Leader around two years ago, after acting as a relief supervisor for some time. Despite his academic background, his only relevant training since joining the company has been a one week front-line managers' course, and a 'training the trainer' course. He felt that, with a premium now being placed on problem-solving skills, the possession of a degree was extremely valuable because it reflected the existence of a trained mind.

Some of the 'traditional' supervisors had reservations about the likelihood of the Team Leader system working, largely because they felt Team Leaders would not be accorded the respect that had been bestowed on the supervisors. On the shop floor, this would result in a feeling that, without the discipline imposed by the supervisor, they would be able to enjoy a free rein. According to one respondent the supervisor had been 'an icon', to whom the workers looked for leadership, and the diminished responsibilities of the Team Leader could well result in a lack of authority. Another respondent suggested that the position of the Team Leader had been devalued to the point where they would give it to anyone and, in future, the Team Leader would resemble the old chargehands, rather than supervisors.

In contrast to the perception of non-graduate Team Leaders, graduates considered that the selection of Team Leaders tends to be on ability to a greater extent than in the past, where experience was the essential pre-requisite. Nonetheless, some experience is also required. One aspect of the current organisational structure which helps individuals to acquire the necessary experience to progress to Team Leader status is the system of rotation of jobs, whereby people can move around the plant and therefore gain a better all-round understanding of the operations. Previously, an individual's experience may have been relatively narrow, which could have militated against their capability of becoming a supervisor.

One graduate team leader thought the main attributes required to be an effective Team Leader were:

- Technical knowledge – this is essential in order to generate respect from the rest of the team.
- The ability to treat people as human beings, as exemplified by taking notice of their opinions. It was also asserted that Team Leaders needed to understand that management styles may need to differ according to the needs of the individual team member.
- Organisational skills – there is a great deal of liaising with other departments, external suppliers etc. Also, the contractors need to know who to come to.

Overall, respondents felt that the teams were responding to the new structures in the desired way, by taking more responsibility. The Team Leaders were also beginning to offload some of their paperwork to the office staff, thereby reducing that element of the workload which supervisors had experienced. Indeed the graduate team leaders thought that the standards expected of them were higher than those that had been previously expected of supervisors.

5.2.2 CASE STUDY – UK ENGINEERING CONSTRUCTION

The engineering construction company case study site was primarily responsible for 'Process and Energy' services, focusing on the offshore oil industry. The company as a whole had just reorganised itself into three distinct business sectors based upon: *Capital projects*, incorporating civil engineering, construction and onshore process and energy; *Services*, comprising offshore process and energy, rail, utilities and facilities; and *Investments,* comprising project investments, plant and transport. This reorganisation reflected a change of strategy, involving a conscious decision to move the company away from major projects, and towards services. There was also a

recognition that they could not necessarily buy in all the expertise they would need for specific jobs. Therefore, they would need to share expertise with other 'competitors'. As a result, they have successfully bid for large contracts from the major oil-producing companies, by bidding in collaboration with these former rivals. Product service contracts usually last for 5-7 years, with mini-projects in between.

Within these overall changes, the role of supervision and management has had to be revised. Most significantly, whereas in the past the company used to provide 'bodies' to work on the offshore oil rigs, without the responsibility for managing them, the new system of collaborative management of projects means that they are responsible for the overall process, and 'man-management' is a vital part of that role. Operatives at all levels have to be accountable, which places great responsibility on the supervisor, because they are at the interface, and can therefore control what goes on. At present, there are approximately 900 'core' staff and around 2,500 contract staff. Currently, emphasis is being placed on converting the best of the contract staff to 'core' staff. Core staff tend to be in the areas of engineering, planning, Human Resources, quality etc.

As far as the type of supervisor required for this new role was concerned, it was stated that "having people you know and trust as capable to look after the local workforce" was the prime concern. Appraiser training has been carried out with all supervisors and managers, to enable them to identify and address the training needs of their team members. The implementation of appraisal is tracked centrally. There is also now a comprehensive training plan, with a budget which, for 1998 was £1.9 million for 2,000 people (core staff plus contractors and self-employed). Additional training, relating to Health and Safety, is compulsory for those working on the oil platforms, and is provided by the oil companies with whom they have the service contract.

While training was once referred to as 'the black hole', there are now signs that managers are realising its value. It is also effectively conveying the message to staff that the company is prepared to invest in them. Formerly, offshore supervisors just used to oversee the construction crews, whereas nowadays their business is maintenance, rather than construction. The development of supervisors is a "main thrust" of the company at the moment. It is accepted that the requirements of a supervisor are now quite different form what they used to be. They now have to have a plan of how to deploy resources, with regard to what is important for the client. A crucial difference is that 'self-reliance' is now much more important. There is greater autonomy in decision-making, although those decisions have to be taken within a framework of rules and guidelines and may need to be justified. For those working offshore, there is a need to be able to be accepted as part of a platform crew, and to support that crew. Therefore, interpersonal skills are essential. They also need a degree of 'business nous' and the ability to 'think on their feet'. Their importance, as the front line representatives of the company, is considerable. The ability to communicate is regarded as a vital element of the supervisory role.

The qualities required of the supervisor were characterised by one supervisor as part mechanic, decision-maker, 'agony aunt' and planner. The planning aspect is particularly important prior to the implementation of a project, as the statistics and agreed procedures have to be sorted out. Once the project has started, then more time may be spent in meetings. Another aspect of the supervisor's role which has changed

is that there is more emphasis on the management of the discipline. Whereas previously supervisors were given a budget by the engineering manager, they now have to devise their own budget and submit it for approval. As far as technical skills are concerned, their importance for the supervisor has diminished, because they are able to delegate these tasks to members of the team

One consequence of the introduction of greater multi-tasking, such as that involving platers and welders, is that, once the team has started to work well together, the supervisor is able to give them more responsibility. Thus, although the supervisor still has to monitor the work regularly, certainly in terms of safety, they have more time to attend to their administrative duties. The number working in the teams can vary, according to the requirements of the job, but is unlikely to exceed twenty. The day-to-day working is driven by the plans and any breakdowns. A 'close second', as far as the supervisor's role is concerned, is the organising function. A managerial function tends to be restricted to those occasions when there is a degree of conflict between operatives or between operatives and workers from partnership companies. Diplomacy may be required in this case. As the engineer on the job they would always have the last say as far as technical matters are concerned. If there is any doubt about what to do, they are able to call on the support of the onshore 'beach' staff.

Each of the team members has to be assessed by the supervisor every six months, and if any training needs have been identified, a request for money to be allocated for the necessary training is submitted. Some supervisors regarded this personnel element of developing members of the team as one of the most enjoyable and satisfying aspects of the job. These supervisors attached great importance to the mentoring role, and saw the development of individuals as being vital to the building up of the team as a whole. Supervisors themselves were very aware that the job had changed considerably, from "one of the guys taking the lead role" to "a management decision-making role". The degree of responsibility had increased, largely as a result of the organisational restructuring, with much greater involvement in decision-making. Thus, rather than tending to be reactive, the supervisor was now treated as being part of the bigger picture and was consulted by senior management more regularly. It is also felt that the administrative burden is greater than it was, because of a reduction in administrative support and a need to report regularly to the Personnel Department on a number of issues.

The majority of supervisors had an engineering craft background, but there are graduates too, and there is no single career path to management. There are many managers, some with technical skills, others with experience of dealing with clients and getting things done. This still leaves room for people with 'nous' to get on. The traditional route to supervisory status form engineering grades was through standing in for the supervisor on a temporary basis, to establish their suitability for the post. During the restructuring of the organisation, when the number of platforms being operated was increased from two to five, people were systematically interviewed and tested to assess their suitability. As part of the process, there was a concentration on the amount of training which might be required, and people's own aspirations. They were asked to produce scenarios of their response to hypothetical events.

In contrast to earlier times, when little formal supervisory training was provided, the concern for developing supervisors and middle managers has seen the introduction of

two major training and development programmes: ASDEP for supervisors, and 'Charter Plus' for middle managers. These both provide the opportunity to attain formal qualifications, and, crucially, involvement in the programme, which includes residential weekends, has benefits in terms of increased networking. The latter is considered to be extremely important, as individuals can become isolated working on projects. Initially, both these programmes tended to be predominantly composed of males, but more females are now enrolling. Theoretically, there is now a progression path through training for those in the company, beginning with Safestart, followed by ASDEP, Charter Plus, and, ultimately, through to an MBA. There are over 100 on Charter Plus at present (of whom a quarter are staff of 'client' oil companies), with a further 50 on the Management Programme. The ASDEP programme entails the achievement of a National Vocational Qualification (NVQ) at Level 3. Charter Plus has been developed in conjunction with a University Business School and results in the attainment of academic qualifications and NVQs. Contractors often feel under pressure to participate in training and development, because of their financial dependence on the company, while core staff often need to be 'pushed' to participate.

However, from the supervisor's perspective, keenness, a willingness to learn, an acknowledgement of when additional help is required, and the ability to deal with people are regarded as being more important than qualifications, or, indeed, any particular background experience. There has been a recent increase in the number of graduates working as offshore supervisors. One reason for this is that the company is seeking to increase the number of prospective managers with experience of working offshore. Some resentment was voiced about graduates in supervisory posts not necessarily having had 'hands on' experience. Although there are still some of the old-style supervisors around, overall, supervisors now tend to be a lot younger. This is because they are appointed for their abilities, rather than through the length of time they have served in a job.

For the majority of the skilled manual workforce, the opportunity to attain supervisor status is regarded as the only possibility for career progression. Thereafter, it is accepted that additional academic qualifications would be required in order to progress. However, doubts were expressed by some supervisors about the likelihood of the present route from trade jobs to supervisory roles being maintained, even though currently there were 'good career paths' within the company. The increased attachment to academic qualifications within the organisation was suggested by one supervisor, who already possessed a degree, but felt that by undertaking a post-graduate qualification, possibly an MBA, this would help to get her noticed by senior management and improve her chances of promotion.

5.2.3 CASE STUDY – UK ENGINEERING ENGINES

The company is a major producer of engines for a wide range of applications, including agricultural machines and vehicles, industrial vehicles and machinery such as fork lift trucks, power generators and earth moving equipment, boats, and a variety of vehicles, such as dustcarts. The capacity range of the engines produced is from 8HP to 2500HP. Much of the production is exported, with competition largely coming from companies in Britain, Germany and Japan. The company was formed in the 1920s and for many years was a traditional family-run organisation. However, recently it was taken over by an American-based multi-national company whose main product was earth-moving equipment. For over seventy years, the company has been

the most significant manufacturing employer of labour within its local labour market. Many local people saw it, in employment and career terms, as a desirable employer. Some years ago, there were about 670 supervisors and approximately 10,000 employees at the plant. Nowadays, there are about 27 supervisors and about 1600 manufacturing employees, of whom about 130 are employed on a temporary basis.

The company is undergoing a process of considerable structural reorganisation. This has included a phasing out of the separation of the production of different ranges of engines between different departments, and of the separation of the machining and assembly functions on different sites. As a result, the whole of product supply was being brought more closely together on one site. This has meant a reduction in the need for some management and supervisory time, and a rationalisation of the workforce. Crucial to this process has been the introduction of a system of teamworking, with the phasing out of the old supervisory grades and the creation of team leaders reporting to team coaches. At the same time, because of the rapidly changing technological requirements and skill needs within the industry, there has been a shift towards multi-skilling.

Assessment Centres have been established, in order to identify the skills, qualities and deficiencies of the workforce. Over and above technical skills, the appropriate attitude is now considered to be an essential requirement. The company has been seeking to enhance quality and has introduced training courses designed to reduce defect levels, by teaching operators why things work or are needed to be done. Allied to this has been a series of upskilling programmes for operatives (Total Product Maintenance) which have been based on the concept that the operative 'owns' the machine and is responsible for minor repairs etc. Team Leaders are seen to play a key role in this embracing of quality and the training requirements.

A supervisor could formerly have been responsible for three sections, with over 50 workers, and therefore did not have time for each individual's problems. In 1997, this structure was transformed into a team-based organisation (TBO), with responsibilities for line management being vested in Team Coaches, who would each be responsible for a number of teams, comprising 8 to 15 employees, with a Team Leader. The Team Coaches, who broadly occupy the role formerly taken by Production Managers, are each accountable to one of four Manufacturing Coaches, who report to the Managing Director. A typical Team Coach would have about 100 employees within his remit. The Manufacturing Coach has four team Coaches, and so is responsible for 500-600 people.

The Team Coaches are now given extra responsibility, for example, for organising overtime and budgets, but they are also accountable. One Team Coach saw his role as primarily to create a cultural change, away from the traditional pyramidal structure to a culture based on teambuilding. In order to achieve this, it was asserted that a combination of 'new blood' and 'anchors' (traditional supervisors) was needed. For the integration of teambuilding, it was important to have an understanding of what made people 'tick'.

Although this structure is still relatively new, and cannot be said to have been properly embedded and accepted, this in turn is being transformed to accord with the development of a Supply Organisation structure. Here, while the roles of Team

Leaders, Team Coaches and Manufacturing Coaches will essentially remain the same, the company will operate as a series of Business Centres, with, for example, a Production Manager for each engine range. Ultimately, it is anticipated that this will mean that there are about 144 Team Leaders. The underlying rationale for the teamworking system is that, once the team identifies the route to solve a problem, they will follow it through, partly because of 'personal and team pride'.

The Team Leader normally has no more than 10 people to look after, and is part of the team. They are responsible for production, quality, cost, safety and efficiency within their cost centre, and report to the Team Coach. A Team Leader is on a fixed salary, with the addition of a performance bonus, which varies according to band within which they are allocated. In addition to his/her operational tasks, he/she also has to sort out the labour sheets and budget sheets. Their role is to empower, and develop an interpersonal relationship with the team, primarily through the sorting out of the work. In this, they can consider the development of their team members. The Team Leader has to recognise and balance the needs of the team, and of individuals within the team, and team members can alternate or rotate tasks if they want to. The Team Leader is much closer to the workers than the traditional supervisor used to be and has more ownership of the work. From a Team Leader's perspective, the key attributes or requirements were:

- To keep the track going – production is the most important thing
- To be organised, so that breakdowns do not unduly disrupt other sections
- To decide when to involve the Team Coach
- To ensure that quality is maintained.
- Having patience and listening sympathetically to team members

Formerly, supervisors were recruited from those shopfloor workers who had been identified as being good workers and capable of taking on managerial responsibilities. No specific qualifications were required and graduates were not recruited for these posts. They subsequently received some training in communications and management. According to a manager who has responsibility for effecting greater quality, through the introduction of teamworking, the major change in the supervisory role is the increased emphasis on the need for those in supervisory positions, especially Team Leaders, to develop comprehensive inter-personal skills rather than concentrate on technical knowledge. Previously shopfloor experience was considered to be very important, and some graduates who were appointed as supervisors struggled through this lack of experience.

The recruitment of team leaders was initiated by the placing of advertisements on the works noticeboards. It was thus open to anyone to apply. Those who applied were then assessed for capability at an Assessment Centre, where the emphasis was on technical skills; management techniques and communications. When recruiting Team Leaders, leadership qualities were sought rather than technical skills. In order to identify these leadership qualities, candidates were given verbal and mechanical reasoning tests prior to the assessment/development day. A Team Leader considered that in the recruitment of Team Leaders the company was looking for 'personality', the ability to cope with stress, and, on the basis of test results, evidence of leadership qualities.

Originally, it was envisaged that 80 per cent of a Team Leader's time would still be spent on operative tasks. However, although this is true in Assembly, in Machining it is only around 20 per cent. Consequently, in Machining, the Team Leader tends to be looked on more as a supervisor than as part of the team. Overall, though the Team Leader is still seen as being more accessible than a traditional supervisor, who used to look after 75 people, and would therefore be unable to spend much time addressing the needs of those under his/her supervision.

Some graduates have been recruited on a two-year development programme to Team Coach positions, while other Team Coach positions were filled by former supervisors. There is a progression route to higher level management from Team Coach. Indeed, one of the Team Coaches interviewed had only recently been promoted to Operations Manager. He had originally been recruited through the temporary employment agency and had only been with the company for just over a year. Although he had not been recruited through a graduate route, he had previously gained an engineering degree, having been sponsored by his previous employer as a mature student. He had received no specific training for his new roles, and prior to joining the company had done only one management course, which was at Diploma level. He now has a Team Coach reporting to him, who, in turn, has seven Team Leaders.

Assessment Centres are used to assess applicants' competence to fulfil the Team Coach role. All assessment, appraisal and training programmes are currently being re-vamped. It was felt that Team Coaches and Team Leaders should receive more training in management and interpersonal skills, possibly as part of their initial training. The key characteristic required of a Team Coach, as well as technical knowledge, was perceived to be the ability to resolve the issues of those for whom they were responsible, possibly through mentoring. This places a responsibility on the Team Coach to get to know their own staff, and gain their respect, by knowing that they are being asked to do 'sensible' things. As a consequence, the major concern of Team Coaches was people-management.

A perceived stumbling block to the achievement of self-empowered teams was the age profile of the plant, with an ageing workforce, very low labour turnover, and insufficient interest among the team members to stimulate deep-seated cultural change. One Team Coach felt strongly that the culture could not be changed by Team Coaches and Team Leaders – it can only be done by the workers in the teams. This was regarded as the critical issue, which was recognised, but there was a lack of certainty about how it could be achieved.

Some Team Coach positions were filled by traditional production managers, while others were recruited externally. There is a big difference between the two. For example, whereas traditional supervisors still tend to 'manage', external applicants tend to be more steeped in coaching techniques, although they also get bogged down in production demands. There is a distinct difference between 'traditionals' and 'externals' in their approaches to their roles.

In terms of the amount of time spent on training, whereas 20 years ago, initial training for supervisors lasted for 6 weeks, it was now down to a matter of days. Also, due to the constant pressure under which Team Coaches and team Leaders work, they do not get sufficient time to look at their own needs. As a result, training can tend to be

reactive rather than proactive. At the same time, continuing training and education needs are being identified. One Team Leader cited a an array of training courses which he had undertaken in recent years, including *Kaizen*, management development, teamworking, Team Leader, Total Quality, Health and Safety etc. He was about to embark on a Forward Thinking course.

Some supervisors were appointed to Team Coach positions, but the majority have moved on. Some of the 'old time' supervisors are not comfortable with their new role, and seem to take the change as a personal sleight on their ability. Moreover, they still see the TL position as requiring a traditional supervisory role. Those who were not made Team Coaches went into a wide range of other jobs, such as training, quality engineering, supplier quality etc. Many were resistant to change, but it was felt that the company had tried to look after them, and they were no worse off financially. Some took early retirement. The 'traditional' team leaders interviewed, whilst doubting that they could personally change, nevertheless displayed a ready acceptance of the need for change, and an understanding that more change was likely.

There was a noticeable difference, in terms of future career aspirations, between those Team Coaches and Team Leaders who had been with the company for a long time (and therefore tended to be older) and those more recently recruited, including graduates. The former, not unexpectedly, saw themselves remaining with the company for the rest of their working life, with the assumption that they would accommodate whatever organisational and structural changes were introduced during that time. In contrast, the latter were setting their sights on promotional opportunities within the company, or considering future progression outside the company.

The consequences for shop-floor workers in terms of possible progression were dramatic. The restructuring has meant that individuals' personal development opportunities have opened up significantly. There are annual assessments or appraisal, with subsequent training (for example team leadership training leading to NVQs), most of which is on-the-job. There is also greater openness in communications, with regular team briefings, a monthly magazine etc. This has generated a belief that they are more involved in the way in which things are run, but does not detract from the fact that they were sceptical about the motivation for some of the changes introduced, believing that the reduction of manning levels was a prime consideration. The perception from those responsible for training is that the introduction of teamworking and new machinery has opened up progression routes within the plant, and encouraged a wider range of employees to put themselves forward for consideration for appointment to positions such as Team Leader.

5.3 Increasing importance of graduates in the national education and training system and in the new recruitment policies for industrial supervisors

The new recruitment policies for industrial supervisors tend to emphasise either the management of processes, systems and people, or else the management of people, training and development. This means social skills are at a premium, and while significance may be attributed to the possession of work process knowledge, technical leadership is not necessarily required. It could be that this is one viable response to the limited supply of and weak demand for intermediate level skills. In any event the

development of greatest significance for the new recruitment policies for industrial supervisors is the increased supply and demand for graduates.

There are three ideal-types of supervisory role currently required in UK industry. The first (managerial) type still relies primarily upon exercising first-line managerial control in settings that use mainly semi-skilled labour. 'New style' managerial supervisors in lean production (assembly line) settings, even those making some use of team-work, need particular strengths in managing processes and systems and in the management of people. Such supervisory roles show a clear continuity with the past, but the supervisors are now given greater responsibility (through the removal of layers of junior and middle management) and more attention is typically given to their communication abilities upon appointment (Wickens, 1987). They are likely to have considerable work experience, irrespective of whether or not they are graduates.

The second (training support) role is often exercised by team leaders, with responsibility for supporting semi-autonomous teams, who need particular strengths in 'soft skills' relating to communicating effectively and supporting people, including recognising training and development needs. The teams themselves have responsibility for managing processes and systems, while technical skills are either more widely distributed across teams or are supplied by specialists. This group is the one for whom 'social skills' are paramount, and certainly over time you would expect increasing numbers of graduates to perform this role. Graduates working as team leaders are also likely to have previous work experience, in some cases working as technical specialists. Alternatively they may have earned their degrees while working. Either way you would expect most post-holders at this level to be both graduates and to have had substantive work experience.

The third (technical) type of supervisory role is undertaken in settings requiring specialist group work in 'high performance' workplaces. Those exercising technical leadership are likely to have particular technical expertise and highly developed communication skills. For younger staff this almost certainly means they will be graduates. Non-graduates could undertake either of the first two roles, and one source of comparative advantage may be a greater appreciation of the value of work process knowledge (Brown, 1999). The supervisor promoted from an experienced worker role may personally have a thorough understanding of the contextualised work process knowledge relevant to that company. If this important, then for a graduate to be employed in this role then there are two choices. The first is that graduates spend time in a support or more junior role acquiring that work process knowledge prior to promotion. Alternatively, it may be that the distribution of such knowledge between team members makes it less important that the supervisor or team leader too has personal experience of using that knowledge. In this case, though, the supervisor or team leader has still to value the possession, and support the development, of that knowledge in others. Companies may also wish to recruit a mix of different types of people to supervisory positions, including graduates and non-graduates.

Overall, it would appear that the national education and training system and the new recruitment policies for industrial supervisors, with their emphasis upon the value of social and communication skills and increasing reliance upon graduates, are broadly in balance. The expansion of HE is a UK educational policy area where there has been conspicuous success. Almost 40% of each cohort now enter HE, compared with 12%

just over thirty years ago. HE Graduates generally have excellent medium and long term prospects: three and a half years after graduation only 2% of graduates are unemployed and only 10% are employed in non-graduate jobs (Elias et al, 1999). The lifetime earnings of graduates are considerably more than non-graduates, and most 1995 graduates were employed in professional, associate professional, management or administration within three and a half years of graduation (Elias et al, 1999). Maths and computing and engineering and technology graduates were the least likely to have experienced even initial problems getting employment (Purcell et al, 1999). Also many subjects in HE now have a very strong vocational orientation and most engineering graduates will have had extended periods of relevant work experience before graduation. Indeed over two thirds of recently qualified engineering and technology graduates pointed to work experience in that or a similar organisation as an enabling factor in getting their job (Purcell et al, 1999).

This does not mean all graduate recruits are fully work-ready, but employers recognised that they did have the potential to learn quickly the additional skills and knowledge required. Graduates were also very likely to receive further formal training, including through participation in work-related short courses (Elias et al, 1999). The tangible economic benefits of attending HE and the lack of regulation over preconditions for job entry means that only in some particular occupational areas, and/or where individual commitment to a specific direction is high, does it make sense for an individual with relatively high educational attainment to leave general education tracks. This has contributed to the development of a 'mass' HE system and has meant that fewer graduates go straight into 'graduate jobs'. This has had three significant consequences.

First, graduates are increasingly likely to start in a wide range of jobs, and are often prepared to move between jobs to build up experience in the first few years after graduation (Purcell et al, 1999). By this means, they move progressively towards a job that is broadly commensurate with their qualifications. Second, it does mean that employers can recruit academically well qualified people to fill positions in a way that adds value for the employer (Mason, 1996). Third, Wilson (1995) argues that there is some evidence that when more highly qualified people are recruited the nature of the job to which they are recruited itself changes. Indeed, Soskice (1993) argues that it makes more sense for employers to recruit graduates, with generally more highly developed communication skills, willingness to learn and other 'key qualifications' but without any appropriate specifically vocational training, than to attempt to develop or secure individuals who had been through initial vocational training. The argument is that graduates can then be given specific training and/or develop their skills through on-the-job training or programmes of learning while working.

The implications of this for the new recruitment policies for industrial supervisors are that there is a ready supply of graduates with most of the requisite communication and social skills for successful performance as supervisors. What they may lack is appropriate work-process knowledge in certain circumstances. This too, however, can be rectified through combinations of working and learning, including in some instances such as aerospace through formal graduate apprenticeships, or else through initial appointment to more junior or specialist positions prior to appointment as supervisors. The type of supervisory posts most likely to recruit graduates in future

are those in workplaces requiring high-level skills and who are looking for their supervisors to provide some technical leadership.

Recent changes in HE align very well with these requirements. Many of the large employers with a commitment to learning, training and development have 'tailored' work-based degree programmes that enable employees to pursue substantive qualifications while continuing to work. Additionally, many HE institutions offer part-time programmes specifically designed for those in work. These programmes include technical skills development, management skills, communication skills as well as offering cognitive development, and include practice-based components. The programmes generally offer opportunities for accreditation of prior (work-based) learning, and will often be available in modular format, such that those at work do not necessarily have to complete a full programme. Many modules and programmes can also be delivered through distance learning or open learning formats. All this means that it is hard to envisage those in supervisory positions in high-skills workplaces not having substantive experience of HE in some form either prior to or shortly after their appointment as supervisors.

The above workplaces are still likely to be in a minority given the cultural and historical resistance to investment in training that has characterised much of British industry (Brown and Evans, 1994). Even this though is starting to work in graduates' interests in certain SMEs, as graduates are increasingly being seen as the people most likely to be able to cope with learning through doing the job itself, with relatively little training or support (Rajan et al, 1997). The lesson to be learned from this is that the future is particularly bright for those who can demonstrate substantive learning, development and achievement in work and higher education, but that learning can take place in either setting first or contemporaneously. Indeed in many HE programmes learning at work is increasingly encouraged, recognised and accredited.

5.4 Implications for the recruitment of industrial supervisors

The UK economy has had historically and comparatively an under-developed intermediate skills base, but British manufacturing industry has adjusted to this and there is now weak demand for such skills and no evidence of problems of recruitment at this level. The structure of UK industry is such that few companies depend on high levels of skill as a source of competitive advantage. This means it is important to distinguish between the skill requirements of the relatively few companies with high skills visions and the majority of companies still mostly requiring operator level skills from most of its workers. Many companies in both sectors have restructured their organisation of work, but with very different consequences for the role of the supervisor.

Many of the mass production companies have opted for reorganisations based around ideas of 'lean production'. The 'old style' supervisors in these companies were often poorly qualified, inadequately trained and under-equipped to fulfil their role of managing processes and people. In practice, their role was progress chasing and telling people what to do. Under pressure from higher performance targets and greater work intensification the 'new style' supervisors had the same basic role, but they were given greater responsibility, more pay and more training. Much greater care was taken in their selection, with particular attention being given to possession of, or willingness

to develop, communication skills. The need for socially skilled supervisors, especially if they working with production teams and/or operators who had had their roles enhanced, led to recognisable skill gaps. Some of the 'old style' supervisors were retrained, but those who could not adapt were replaced. The new more demanding skill requirements for supervisors meant that companies were likely to consider a wider range of people for these posts. They were unlikely to be graduates without substantive work experience, but similarly the increasing importance of non-technical skills and the lack of any requirement for technical leadership meant that companies were likely to look beyond the ranks of the traditionally skilled workers. They were looking for individuals who possessed the right personal characteristics and attitudes, irrespective of their previous background.

The skill gaps identified at these intermediate supervisor or 'team leader' levels included motivational skills, communication skills, the ability to forward think and plan, and the ability to think strategically. Graduates with work experience would be welcomed if they met these criteria. Most companies though thought they could cope with these demands through broadening their recruitment and selection processes and through encouragement of individuals to take further training and development. Similarly any development needs for shop-floor and machine operator staff were largely identified along with any change or investment programmes, and progressively met with internal training. The much more serious, possibly emergent skill gaps were in the areas of senior management's capability to transform the business systems (manufacturing processes, design/development processes) for competitive advantage. The case studies of Shackleton et al (1999) noted that skill gaps amongst professional and managerial engineers were associated with people not having the required combination of technical and non-technical skills. Skill gaps were evident in the non-technical skill areas including project management, people management skills and possessing a rounded level of commercial awareness.

Shackleton et al (1999) also pointed out that recruitment problems were limited and hard to fill vacancies were mainly found in the higher skilled occupations, particularly professional engineering graduates with 4-5 years commercial experience. There was a particular shortage of professional engineers with a combination of specific technical skills, commercial awareness, project management skills and other "soft" people management skills. The labour market was considered extremely tight for particular engineering specialisms such as system analysts, design engineers and wage inflation is very high for these occupations. Such companies did not have problems recruiting graduates onto their formalised training programmes, but they did have real problems trying to retain professional engineers, with a few years experience, who could provide technical leadership.

In summary most of the 'lean production' companies have a skills mix of operator and intermediate skills, and patterns of organisation of work, that are well adapted to their product market strategy and the labour market. Where they do have serious skill gaps these relate to the capabilities of senior management to continue to transform business processes for competitive advantage and difficulties in retaining graduate engineers to provide technical leadership in the implementation of transformation of processes of design, development and possibly manufacturing.

6. Cross-national conditions of the new personnel policies

The study has revealed a number of conditions facilitating the establishment of new recruitment and selection policies for industrial supervisors. Some of these conditions appear to display similarities across the companies and the countries covered. But their effect on the new recruitment and selection policies varies between companies and countries. Furthermore, other more specific factors are also relevant. Two groups of cross-national conditions can be differentiated: context-related factors facilitating or accelerating the new recruitment and selection policies and the company goals driving these policies.

6.1 Context-related factors

Company policies directed at rationalising employment
All companies covered have rationalised employment, although the extent, type and timing of the measures vary across the companies studied. Six companies have significantly reduced their workforce and three companies (FM1, DC, DM1) have experienced a substantial fluctuation in their workforce numbers, despite a recent increase in the number of employees. In general, these changes have impacted on the number of supervisory positions, and they have also weakened the position of workers as the recruitment reservoir for supervisory and management positions (with the exception of FC1 and DM2). There is also a tendency that industrial supervisors are facing increased productivity demands as a direct result of rationalisation.

Local labour market conditions facilitating the new recruitment and selection policies
Against the backdrop of declining employment levels in industry, companies benefit from the imbalance of supply and demand on the labour market, with this factor affecting new recruits most of all. A number of companies enjoy a favourable labour market position (DC, DM2, UKM1, FM, FC1, FC2), due to reduced competition from other companies, high regional unemployment levels, or because their wage levels are higher than the local average. Furthermore, some German and French companies have developed close links with local education institutions (DC, DM2, FM, FC2), which assists them in the recruitment of highly qualified staff. Due to the labour market situation and internal restructuring, several companies tend to employ highly qualified staff in less rewarding positions than these staff would have expected previously (DC, UKC, FC1, FC2, FM). That means, the highly qualified lose out financially compared to their peers or even to those holding those position prior to the restructuring.

The impact of weak industrial relations on the representation of interests of industrial supervisors
Irrespective of the company and the country, there were only few manifest conflicts over the establishment of new recruitment and selection policies. Occasional forms of resistance have been reported, but they were very limited in scope. Concurrent staff cuts may be one reason why so few had protested against new recruitment and selection policies, as worker representatives were more interested in securing jobs than concerning themselves with issues of promotion. But also a range of other factors have contributed to a low resistance, such as the gradual establishment of the new recruitment and selection policies, the current and future position of the industrial supervisors within the company or the loss of union power in two UK companies.

Similar developments in relation to changes in production structures
The production units of all companies covered belong to multi-national corporations. Therefore, economic, financial and strategic autonomy is limited, which in turn impacts on personnel policy. Following pressures to maintain productivity in a competitive environment, production processes have been restructured internally. This has lead to a tendency to increase centralisation in some areas and concurrently increase decentralisation in other areas; the resulting pressures of which impact on the duties and responsibilities of industrial supervisors. Centralisation means that the management is now much more in charge of setting production norms, particularly in terms of the early and final production stages, leaving decentralised production units and industrial supervisors de facto with limited autonomy. Decentralisation manifests itself in the increasing importance of formalised work processes and the establishment of team-work and flatter hierarchical structures, although even where the hierarchy is not flatter in terms of levels it is greatly reduced in terms of number of people in the management structure (see FM, UKM1). As a consequence, operational management competencies have become more important, whilst at the same time technical competencies are also seen as vital to deal with the increasing technical pressures of the job. And in some cases, industrial supervisors have had to take on increased leadership responsibilities, whilst at the same time there is also a need to be in close contact with the teams.

6.2 Common goals of the new policies - as expressed by companies and observed in practice

Role and competence expectations of industrial supervisors
Representatives of the personnel function in all nine companies covered argued that changes in recruitment and selection policies were mainly caused by changes in skill demands associated with the new role of the industrial supervisor. As a matter of fact, changes in job titles for the range of positions that are covered by what we are calling *industrial supervisors* were found in seven out of the nine cases. This seemed to be indicative of intended organisational changes as well as cultural changes associated with the new role. Executive managers were expecting industrial supervisors:

- to have acquired a more formalised body of knowledge than their predecessors to cope with technical skill demands and more formalised ways of working;
- to practise a new leadership style, which puts more emphasis on motivating employees and further developing their skills instead of simply controlling staff,
- to have social and commercial skills, as industrial supervisors now have to liaise with a broader range of people, both internally (in other production units) and externally (with suppliers and customers).

Quite often traditional industrial supervisors are seen to be lacking these qualifications. Personnel managers therefore argue that new recruitment and selection policies need to be put in place. The highly qualified are seen to be offering a whole range of required and valued skills, and they are regarded as capable of delivering the cultural changes required.

The introduction of new career roles
Companies have started to call into question established career paths for workers, although the companies vary in terms of how explicitly they pursue the establishment

of new career roles and why these changes have been introduced. They believe work experience should no longer be the sole criterion for promotion to a supervisory position in production. Instead, new criteria are to be established and they are to be evaluated employing new recruitment and selection tools - particularly in UK and French companies - in an effort to make recruitment and selection processes more objective. Companies wanted to open up supervisory positions to groups other than workers (DC, DM2, UKM1), partly in an effort to break the previously prevailing close working relationships between workers and industrial supervisors (FC1b, FC2).

Changes in recruitment and selection policies have also been motivated by a desire to reduce pay levels. In some cases the newly recruited industrial supervisors had to take pay cuts compared to their predecessors (UKC, UKM1, FM). In other cases pay savings were achieved by, for example, shedding older staff (FC1, FC2).

To summarise, context related factors have facilitated the establishment of new recruitment and selection policies, but the newly designed supervisory and production management structures do not necessarily require skills that are exclusive to the highly qualified. The roles of industrial supervisors could have been tailored differently.

7. Differences in company policies and their national context

Apart from the similarities in the establishment of new recruitment and selection policies, a number of peculiarities and differences exist, pertaining to the economic and organisational conditions, the vested interests of the companies in these policies and the education and training of industrial supervisors. These differences are often related to the country in which the company is situated. Where possible and necessary the national context will therefore be illuminated to assess the effect of national economic conditions on the new recruitment and selection policies and to answer the question whether the case studies are rather more typical or atypical for the general trends in the country.

7.1 Differences pertaining to the economic and organisational conditions

Differences in connection with the economic situation of the case study companies

All three UK companies have seen a much more dramatic reduction of their workforce, not comparable to the rationalisation in the other two countries. Job losses have resulted in falls from over 10,000 workers to under 2,000 in one case (UKM1), and from 7,000 to 1,000 in another (UKM2). Apart from early retirement programmes (as in UKC) no measures have been put in place to cushion redundancies. In contrast, two French companies, when reducing their staffing levels, have actually put in place such measures, including a halt of recruitment, financial support ('social plans') or relocation of employees in the combine (FM) or the introduction of complex packages of worker support (FC1). Two German companies have also seen a reduction of their workforce, partly as a result of worker migration to other firms in the wake of company relocation (DM2). The migration of workers, and *Meisters* in particular, has favoured the establishment of new recruitment policies. The two French companies FC2 and FC1a had reduced their workforce by a long-lasting halt to recruitment. When this was lifted, the companies decided to recruit externally due to a lack of employees they regarded as suitable for promotion to supervisory positions.

The changes in the workforce figures of the companies need to be seen in the context of a permanent reduction in the workforce in manufacturing industry in the three countries. However, there are cross-national differences in terms of extent and speed of this decline and the retreat from manufacturing as a major source of employment.

De-industrialisation is most pronounced in the **UK,** as in 1971, 31 per cent of all employees were working in industry, but in 2006 this share is expected to drop to 14 per cent (Wilson, 1999). Reduction largely took the form of mass redundancies, although these were sometimes followed by phases of new recruitment for certain positions or of agency workers for particular purposes. This development facilitated the recruitment of highly qualified staff as managers, supervisors, technicians or even as workers. Such staff may have had a range of HE qualifications, but over time they were increasingly likely to be graduates.

French industry lost 20 per cent of their workforce between 1982 and 1997, although a number of measures were enacted to ameliorate some of the adverse effects on employees. These measures included financial support (as part of 'social plans'), various forms of early retirement and a drastic reduction in the number of new

recruits. In these 15 years the absolute number of industrial supervisor positions dropped considerably. Also, the number of industrial supervisors between 35 and 50 increased, indicating that, despite the employment of the highly qualified, there were still promotion opportunities for workers, albeit that these were increasingly limited.

In **Germany**, the share of employees working in industry dropped from 41 per cent in 1980 to 32 per cent in 1997 (Baethge, 2000). *Meister* positions in industry were markedly more affected by staff reductions than for the workforce overall. As in France, the development of the age distribution shows a concentration of *Meisters* in the age group between 35 and 50. These data together with those on the qualification structure imply that the extent of substitution of *Meisters* by graduate engineers was limited.

7.1.2 Differences in the contractual status of the employees

All three UK companies have reached a level of workforce flexibility unknown to the six companies in the other two countries. Between 40 per cent (UKM1) and two thirds (UKM2) of the workforce are temporary or agency workers or sub-contractors. In contrast, workers in all other companies investigated had permanent contacts, except in one German company (DC), where most of the employees working in production were on fixed-term contracts. The contractual situation of the workforce has a strong impact on how the new recruitment and selection policies are put into practice and on the career aspirations of workers.

7.1.3 Particularities in the changes of production structures and their impact on the recruitment and selection of industrial supervisors

First, it needs to be said that the concrete forms of reorganisation are not fully comparable. Second, the case studies have shown that there are some overlapping tendencies of technical and organisational change, but these tendencies are not homogeneous. And third, the study has revealed that there is no definite connection between changes in hierarchical structures and in the forms of recruitment and selection of industrial supervisors that would allow us to draw up an exemplary company typology. A matrix spanning these two dimensions shows that 11 out of 15 cells have an entry. Yet the data seem to indicate that it is mainly experienced highly qualified staff who are selected as industrial supervisors, irrespective of the status of hierarchical changes, and that those companies that have hardly changed their management structures (DC, FC2) pursue strongly the policy of recruiting highly qualified staff.

The national reports, like the case studies, have shown that it is generally difficult to prove that there are direct connections between the establishment of new patterns of work organisation and changes in the recruitment and selection of industrial supervisors. Qualitative studies in **France**, conducted during the 1980s and the beginning of the 1990s, indicate that the composition of the *maîtrise* had changed following technical change and organisational restructuring. However, different forms of access to *maîtrise* positions have been reported, ranging from:

- the complete substitution of traditionally qualified industrial supervisors by higher technicians in a few large companies;
- the promotion of traditionally qualified industrial supervisors to junior management positions and of the higher qualified to more senior management

positions;
- the co-existence of traditionally qualified industrial supervisors and higher technicians without work experience as industrial supervisors.

Organisational changes in the **UK**, directed towards flatter hierarchies (or at least having fewer people in the management hierarchy) and team work, as well as the recruitment of multi-skilled staff, have had a profound impact on the role, function and skills of industrial supervisors. However, there are no general tendencies in terms of new recruitment and selection strategies for industrial supervisors. The recruitment of highly qualified staff is one option, but this is facilitated rather more by the labour market situation (and abundant graduate supply) than necessitated by organisational changes.

Neither can a definite connection between the introduction of organisational changes and the recruitment of engineers to *Meister* positions be established in **Germany**. A recent representative study indicates that those companies not having introduced technical and organisational changes intend to recruit more engineers to *Meister* positions than those that have already undergone such restructuring (Plicht, 2000). Furthermore, the results of this study do not support the widespread assumption that the number of *Meister* positions necessarily drops following the introduction of teamwork.

7.1.4 The different roles of industrial supervisors in the companies

The roles of industrial supervisors in the companies differed in terms of their duties and in the number of subordinates for whom they were responsible. Although the number of subordinates as an indicator is not without problems, two groups of companies can be differentiated: companies whose industrial supervisors have on average between 20 and 100 subordinates (in ascending order: DC, DM1, DM2, UKM1, UKM2, FM) and those where supervisors have three to fifteen subordinates (FC2, UKC, FC1). However, the type of industry and the national definition of industrial supervisor also plays an important role when it comes to the number of subordinates for whom a supervisor is responsible. In the chemical industry, the number of subordinates is generally lower than in mechanical engineering. In the three German and two British companies, the industrial supervisors, affected by the new recruitment policies, are seen as equivalent to the upper level of production management (*haute maîtrise*) in France. However, in all three French companies and the UK chemical company the group in question is regarded as part of lower management. These results are in line with national statistical data, indicating that the share of industrial supervisors among the workforce in the manufacturing industry is five per cent in France and one or two per cent in Germany.

The same line of division applies to the duties of industrial supervisors. Their responsibilities are far-reaching in all three German and the two UK mechanical engineering companies and narrower in the other companies covered. *Meisters* in German companies have always had far-reaching hierarchical and financial responsibilities, and there are signs that their responsibilities are going to increase even further. In contrast, the responsibilities of *maîtrise* in French companies are more diffuse due to the higher number of management levels. Responsibilities for the budget and for commercial activities lie with the senior managers.

7.2 Differences in the interest of companies in implementing new recruitment and selection policies for industrial supervisors

There are differences in the avowed aims of the executive management between the German companies covered and the French and UK ones. A goal of senior management in some **German** companies is to radically change the access criteria to production management positions. In some cases the desire is to go even further and abolish the position of *Meister*, as this group is seen as antithetical to the introduction of new forms of work organisation and production management. At least in two companies (DC, DM2) these intentions are likely to become reality.

The case studies in France and the UK showed that the authority of traditionally qualified industrial supervisors is less clear-cut and that changes between current and future policies pertaining to the recruitment and selection of industrial supervisors are less pronounced. The **French** case study companies opted for keeping production management positions open to promoted workers and higher technicians alike, even if the companies intend to increase the proportion of higher technicians among industrial supervisors to overcome the lack of qualification potential (or potential for further development) of promoted workers. The co-existence policy serves the purpose of securing social harmony among a workforce that has served the company for a long time. On the other hand, companies are cautious about employing young higher technicians as industrial supervisors too early in their career; they rather prefer higher technicians to grow into these positions.

The **UK** companies with their high workforce fluctuations and employment of temporary or agency staff do not have to worry about some of the problems the French companies are faced with in terms of their career development policies. Like the French companies, the UK ones opted for a co-existence strategy that involved the promotion of both traditional and graduate staff to supervisory positions. The concrete form of this strategy, however, differed from company to company.

7.3 Differences in education and training of industrial supervisors

7.3.1 Education and training of traditionally qualified industrial supervisors

In the past, workers had been promoted to industrial supervisors, but the exact route was very much determined by the nature of the formal qualifications they possessed. In the **German** companies covered, industrial supervisors were predominantly recruited from a pool of qualified *Meisters*, who had already completed a comprehensive programme of continuing education and training. Companies might even have pre-selected the group most likely to be promoted in future by supporting some in their efforts to qualify to *Meister* level (DC, DM2). Yet some skilled workers who had not undergone such continuing education and training, and hence did not hold the *Meister* qualification, were nevertheless also promoted to the position of *Meister*. In the **UK** and **French** companies investigated, workers were first promoted to industrial supervisors and then sent on relevant training courses, as required. In the **French** case clear career paths existed for long-serving workers, indicating the importance of internal labour markets, particularly in the chemical industry.

The **German** case studies reflect the national situation. Around two thirds of the industrial supervisors in industry were qualified to *Meister* level, but a substantial

group was promoted without the *Meister* qualification. In the 1980s the number of qualified *Meisters* increased dramatically, leaving qualified *Meisters* with fewer promotion prospects than in the past. Just recently the number of qualified *Meisters* has dropped, mainly due to changes in funding continuing education and training. In the **UK** and **France** in the past there was little difference in the level of formal education between workers and traditional industrial supervisors upon their appointment, although the latter were often then sent on continuing education and training courses after their promotion. In **France**, nearly one in two traditional industrial supervisors had been educated to level IV or V, equivalent to a typical skilled worker qualification, and about a third had no vocational qualification. Yet the level of education has increased considerably in the past 20 years as a result of government policy, including the introduction of the *Baccalauréat Professionnel* in the middle of the 1980s.

According to the 1988 Labour Force Survey (Steedman, Mason and Wagner 1991) 55 per cent of the supervisors in the **UK** had no formal qualification, 39 % had a vocational qualification and only 6 per cent had a tertiary qualification. From this it can be seen that the traditional industrial supervisor was often poorly qualified even after appointment. Additionally, particularly in manufacturing industry there have been fewer opportunities for workers with craft qualifications in the past 30 years, and this has been accompanied by a corresponding decline in the number of people taking industrial craft and technician (or intermediate) level vocational qualifications. This has resulted in a bipolar qualification structure with the highly qualified on the one hand and a large proportion of workers with few post-compulsory vocational qualifications that require substantive education and training (equivalent to say one day a week off the job training for two years) on the other.

The argument that qualification deficits of the workers have initiated changes in recruitment and selection to supervisory and management positions does not seem convincing in the case of France and Germany, given the improved qualifications of workers, outlined above. Whereas in the UK the pool of workers with craft or technician qualifications, that was always comparatively shallow in any case, continued to decline until the mid 1990s, when concerted attempts were made to revive apprenticeships.

7.3.2 Education and training of the new types of industrial supervisor

In the **UK** companies, the new recruitment and selection policies illustrate a big qualitative leap in the formal qualification structure of industrial supervisors. Concurrently new evaluation structures (such as assessment-centres in UKM1) and (compulsory) training measures are being established for team-leaders or team-coaches, leading to NVQ3 level qualifications in (UKM, UKM2) or to other certified courses (UKC). There has also been an explosion in the numbers of people taking supervisory management qualifications. Those people who have become industrial supervisors in the last few years have therefore had to be prepared to undertake substantive training (and gain formal qualifications) upon appointment. This was not often the case in the past, and this change alone favours those who have already demonstrated that they have learned how to learn. Given the relative dearth of those with intermediate level qualifications, then graduates enjoy a significant advantage in this respect over many workers, who have mostly low level qualifications.

In the **French** companies the introduction of new recruitment policies do not call into question the functioning of the internal labour market. First, higher technicians without professional experience are rarely recruited as industrial supervisors and hardly ever straight into the higher levels of production management. Second, companies intend to create qualification pools (workers with higher level qualifications) to assist in the recruitment and selection of industrial supervisors. FC1 puts more emphasis on formalised and certified vocational qualifications, while FC2 considers workers with the *Baccalauréat Professionnel* as in the pool for possible promotion as industrial supervisors.

In **Germany**, two of the three companies studied had recruited experienced engineers, managers and technicians to industrial supervisor positions (DM1, DM2), whereas DC had employed young engineers without professional experience as *Meisters*. In none of the cases studied were the highly qualified recruited to worker positions prior to their employment as industrial supervisors. In future, DM2 and DC plan to reserve access to production management positions to engineers only. DM1 intends to keep its options open, but expects *Meisters* and technicians to prove that they have the potential and are willing to qualify as technical management experts (*Technischer Betriebswirt*).

Before providing some data on the increasing supply of highly qualified people in order to establish possible connections between this trend and the new recruitment and selection policies, it needs to be recalled that the groups of highly qualified staff substituting for traditionally qualified industrial supervisors are not identical in the three countries covered. There are differences in terms of their education and their positions in their companies.

In **Germany**, the number of students in higher education doubled between 1975 and 1994. The number of engineering students, registered at a *Fachhochschule* (FH), had also risen up until 1994. Since then numbers have dropped due to increased unemployment rates (even among FH engineers), a rise in the number of fixed-term contracts and a decline in the wage levels of newly recruited entrants to the labour market. This has caused concern about a future lack of engineers, which in turn would restrict the ability of companies to implement substitution policies.

In the **UK**, the percentage of an age cohort registering at higher education institutions rose from 12 per cent over 30 years ago to the current level of 40 per cent. A low graduate unemployment rate is indicative of a relatively smooth transition from study to work. However, it needs to be recalled that, unlike in Germany, no collective agreement exists on the connection between level of education and employment. Furthermore, graduates may take up to three years before they establish themselves in what they regard as career-related employment (Elias et al, 1999). Thus graduates will initially accept a wide range of jobs as they seek to build up their work experience. Under these circumstances, the recruitment of graduates to supervisory and even worker positions is likely to become even more common practice.

France saw a similar increase in the proportion of the age cohort studying for a tertiary qualification as the UK. The relevant figures rose from 17 per cent in 1970 to currently 43 per cent. The number of higher technicians (with *BTS* or *DUT*), who had studied industrial subjects, doubled between 1982 and 1997. This study was

undertaken at the end of a recruitment halt, which had caused difficulties in the transition from study to work. As a consequence, a far bigger proportion of higher technicians having graduated recently had to accept positions below their qualification level than their counterparts ten years ago.

To conclude, the increase of the highly qualified (in technical subjects) in all three countries covered, together with more problematic transition from study to work in previous years, have certainly promoted the establishment of the new recruitment and selection policies in many companies. Future changes in the labour market situation may, however, entail a revision of how these recruitment and selection policies operate in practice.

7.4 An overview of the different features of the new recruitment and selection policies

7.4.1 The national context

An increase in the substitution of promoted workers by the highly qualified is most likely to take place in the **UK**, as the following indicators show: a swift turnover in the workforce in the wake of a high external flexibility; the persistent lack of a pool of qualified workers and the concurrent swift expansion in higher education; and a market-led regulation of the relationship between the level of education and employment, reinforced by the decline of trade union power.

In contrast, the situation in **Germany** shows features restricting the extent of substitution, such as a big reservoir of traditionally qualified *Meisters*; a relatively controlled expansion in the number of the highly qualified, particularly engineers, whose figures are even dropping according to recent statistics; and the maintenance of the principle of occupational labour markets, regulated by contracts.

France seems to take a middle position in terms of substitution policy, as it favours co-existence policies. The French situation is characterised by the employment of higher technicians as industrial supervisors, and this has been customary for quite some time; a formal correspondence between the pay band of the *maîtrise* and the qualification level of higher technicians, laid down in the collective agreements; the necessity to create a balance between the opportunities the rapidly growing supply of highly qualified technicians offer and the reduced recruitment capacities of companies; and the more numerous career opportunities for workers, emanating from the greater role medium-level positions play in contrast to other countries.

What about the significance of the case studies against the backdrop of their national contexts? It needs to be recalled that the companies that were selected were those who have actually introduced substitution policies.

7.4.2 The significance of the case studies within their national context

In view of the above outlined general context, the **German** case studies seem to be more of an exception than the French and UK ones. The answer to the question, whether or not the investigated German companies are the front-runners or will still be atypical in future, needs to be seen in the context of the following factors. First, all three German companies were in a crisis or affected by far-reaching restructuring processes prior or parallel to the introduction of new recruitment and selection

policies. Second, most of the workers in at least two companies were unskilled or semi-skilled. In these cases the traditional *Meisters* have a very powerful position, one that executive managers are keen to modify and transfer to engineers. Third, in two cases engineers had been recruited internally following the reorganisation of the levels in the management hierarchy.

The German case studies seem to illustrate that changes in recruitment and selection of industrial supervisors are only perceived as legitimate, if they are accompanied by changes in the functions of these positions or by a transformation of hierarchical levels. Furthermore, the speed of introducing new recruitment and selection policies in the three German companies is very different (and much faster) to what is occurring in the rest of the country. Finally, the introduction of new recruitment and selection policies exposes a polarisation trend, incompatible with the homogeneity and continuity of the classic German model, based on companies investing in initial vocational education and training and of then giving workers opportunities for continuing education, training and possible progression (in order to become qualified as *Meister*).

The three **UK** case studies are much closer to the general developments outlined above, as regards the introduction of radical changes in production - in terms of flexibility of personnel policy, introduction of teamwork and lean management - and the common practice of recruiting graduates to a wide range of positions. The recruitment of graduates is seen as a consequence of changing skill demands, predominantly resulting from intended changes in the work culture. In order for the new recruitment policies to work, graduates need to be mobile in pursuit of their careers and indeed in the case study companies they seem willing to move on to other jobs. There used to be a contradiction between the principle of external mobility and the need for investment of companies in the continuing education and training of supervisors. In the past under-investment in supervisory training was partly because companies feared to lose the returns of their investment following poaching by other companies. Whereas now, graduates are expected to have the behavioural characteristics more in tune with modern work requirements and the capabilities to learn while working. This means companies now have more flexible and more highly qualified staff in a range of key positions, but without themselves having to make a substantive investment in their initial training and development. Indeed, initially, the greatest deficiency of these graduates may be a lack of relevant work experience. Hence they may spend time in more junior positions as technicians or even, for a time, as production workers.

The new recruitment and selection policies of the **French** case study companies also correspond to the national situation delineated above. These new policies were established in the context of rationalisation of employment, but not in a crisis as in Germany. Formal qualifications have become more important, and an increasing proportion of higher technicians has been selected as industrial supervisors after having gained relevant experience, sometimes partly in worker positions. The share of medium-level occupational groups and the number of hierarchical levels have remained high and showed a huge variety of constellations. The traditional career paths therefore still exist for workers, but the actual chances of being promoted are more and more restricted. But these changes are not without contradictions affecting the promotion policies of companies. The policy of ‘competence development’, based

on the recognition and validation of work-based competencies, needs to be accompanied by internal career opportunities, which is hardly compatible with the recruitment of higher technicians externally. The recruitment of higher technicians also reduces the permeability between hierarchical levels, thus restricting career opportunities of workers. And even the promotion prospects of higher technicians are cut down as more senior management positions call more and more for graduate engineering qualifications.

8. Consequences of employing the highly qualified as industrial supervisors

The analysis of the consequences of substitution policies for the employee groups concerned and their companies reveals a range of similarities across countries and companies. But there are also country specific effects as well as similarities between companies in different countries. However, this analysis is faced with a number of difficulties: the long term effects of substitution policies are hardly visible as yet; current assessments of future developments may prove incorrect; and the establishment of new recruitment and selection policies occurred parallel to profound changes in work organisation and management roles, thus making it nearly impossible to separate the effects of the two developments on employees and companies.

8.1 Consequences for the employee groups concerned - differences and similarities

Consequences for workers

Following the establishment of new recruitment and selection policies, the promotion opportunities for workers have deteriorated, at least in the medium term, and the conditions for promotions have changed. Workers with intermediate level qualifications will stand no chance of promotion in companies planning to recruit industrial supervisors exclusively from the ranks of highly qualified engineers (DC, DM2) and fewer chances in companies opting for a co-existence model. Furthermore, workers' career aspirations now tend to be limited to supervisory and low level management positions, whereas the highly qualified can reach senior management levels in companies even in companies that have been reorganised. This is especially the case where companies have maintained or even increased the number of hierarchical levels (FM, DM1, UKC, UKM1, UKM2). Due to the more radical changes planned in future recruitment and selection policies, the career prospects of workers in German companies are likely to be much more affected than those in UK or French companies. Furthermore, workers in Germany will have a stronger feeling of discontinuity given the strong tradition of (self-initiated) continuing education and training leading to enhanced promotion prospects and the low incidence of graduate engineers working in jobs that have been considered below traditional graduate level entry.

However, two caveats need to be made. First, as cautioned before, the introduction of lean management structures also had a negative impact on career opportunities of workers, and the effects of these two changes cannot be disentangled. Second, deteriorating promotion opportunities for workers can only be observed in companies that have recruited workers below the tertiary qualification level. In all three UK companies, workers holding a degree enjoy far better promotion prospects than their counterparts with fewer formal qualifications. Workers in six companies (two in each country) also felt that there is now a greater distance between themselves and their managers, not only due to changes in the management role itself, but also due to the work habits of the more highly qualified.

Consequences for supervisors of having pursued the traditional career path

A common feature of all the companies studied is that traditionally qualified supervisors still work alongside their more highly qualified counterparts in

supervisory and management positions, but their proportion is bound to decrease in future. Changes in recruitment and selection policies have been achieved via early retirements, dismissals or resignations of traditionally qualified managers, particularly in the German and UK companies (DM1, DM2, UKC, UKM1). Traditionally qualified supervisors also sometimes had to take up different jobs within the company, either in staff positions in technical offices or in some cases working on production, following organisational restructuring. Their pay levels sometimes secured (as in the German companies), and sometimes not (as in the UK companies). In contrast, traditionally qualified supervisors in all three French companies have kept their management positions for a variety of reasons.

With one exception (DM2), companies have not created alternative career paths leading to new expert positions; instead job changes were dealt with on an ad hoc basis. Career opportunities only arose for those who successfully applied for the newly tailored supervisory positions (DM1, DM2, UKM1), in exceptional cases even leading to further promotion.

Changes in recruitment and selection polices have been perceived as a devaluation of the traditional *Meister* qualifications in German companies. Initial criticism has given way to resignation to the situation in the German companies. Whereas in the UK, although supervisory qualifications have become more important, this has not increased the likelihood that traditional workers would be promoted. As a consequence, these changes have partly provoked demotivation and scepticism as regards the future for traditionally qualified supervisors in all the German and UK companies covered. Only one French company (FC2) has tried to reduce competition from the highly qualified, partly by offering comprehensive continuing education and training courses for workers with traditional qualifications.

Consequences for the new type of industrial supervisor

The consequences of the substitution policy seem ambivalent for the highly qualified industrial supervisors, fairly irrespective of the country and the company investigated. On the one hand, the recruitment to lower level management positions opens up new opportunities for the highly qualified entering the labour market and career opportunities for those who started in jobs that were not traditionally regarded as graduate level entry. On the other hand, the highly qualified may fear for their medium or long-term career prospects if they stay on for too long in this type of job, if it means they have little change of applying their technical skills, the exercise of which may be vital in the performance of other jobs. Consequently, the highly qualified have a vested interest in moving on to other jobs as specialist staff, causing relatively high levels of turnover in supervisory positions. This is particularly true for Germany (DC1, DM1) and the UK (UKM1, UKM2). In France, the promotion prospects of the higher technicians working as industrial supervisors are effectively capped, as access to more senior management positions requires further demanding studies and geographical mobility.

Furthermore, there seem to be discrepancies between the skill profiles of the highly qualified and the skill requirements of their jobs. The highly qualified recruited to supervisory positions, particularly if it is early in their work career, are seen as having certain skill deficits, even though in some instances they may be formally overqualified for the job, again fairly irrespective of the country and the companies

covered. In the German case study companies, lack of certain technical and social skills and experiences were reported. The situation was similar in the UK, where it was also noticed that graduate supervisors sometimes had difficulties in gaining acceptance amongst the workers. In contrast to an often discussed hypothesis, these skill deficiencies are not only due to a lack of experience, as the examples of many highly qualified with work experience within or outside their current company show. These may also be due a range of other factors, such as the lack of appropriate specialist technical skills and qualifications, including specific knowledge relating to the production process and the plant, and a perception in some cases that they are over-qualified for the job. Such skill deficits were reported in companies in all three countries (DC, DM1, UKM1 and F2).

One interpretation of the discrepancies between the skills required and the skills profiles of the highly qualified supervisors could draw attention to the training measures offered to them upon appointment. Two UK and two French companies provided comprehensive continuing education and training programmes. German companies had no such measures in place, probably due to the fact that two out of three companies had recruited already experienced engineers. However, perhaps a more likely explanation, at least for the UK companies, of the provision of comprehensive continuing education and training programmes for newly appointed graduate supervisors was that this was a reflection that supervisory training was now being taken much more seriously after a long period of comparative neglect.

8.2 Problems resulting from the new recruitment and selection policies for companies

Consequences for the organisation of work
As previously discussed, there is no definitive causality between the new recruitment policies and changes in the number of hierarchical levels and patterns of work organisation. The case studies also showed that there is no definite time pattern in the occurrence of these changes. The establishment of new recruitment policies might proceed, follow or happen concurrently with changes in work organisation and job roles. Nearly all the companies that have introduced new recruitment and selection policies have put more emphasis on systematising production procedures and formalising production control. This trend is likely to increase even further in future, as it gives the highly qualified the benefit of working to their strengths. Changes in production procedures and control have increased transparency and security, but they have also reduced opportunities for the positive contributions of workers that were associated with more empiricist approaches to the complexities of production, as companies admit.

The case studies have also revealed that six companies have not reduced the number of hierarchical levels - a surprising result in view of the avowed lean management philosophy. Three companies (DM2, FC2, UKM1) have even increased the number of levels in the company hierarchy. This change was not intended, yet was necessary to cope with the resultant problems of new patterns of work organisation and changes to recruitment and selection policies. In two of these companies, traditionally qualified supervisors were employed in the newly created positions in the hierarchy. Executives were of the view that the new hierarchical levels were only a temporary measure, and the supervisors too regarded them as a necessary temporary solution. On the one hand,

the failure to introduce the planned lean management structures might be related to the requirement to provide promotion opportunities for the highly qualified. While, on the other hand, even if there were temporarily more hierarchical levels the management was leaner in the sense of there being fewer managers overall.

It can be assumed that complex interrelations exist between the new recruitment and selection policies, the establishment of more formalised work routines and changes in the management hierarchy. More hierarchical levels and a greater distance between executives and production processes, as in some of the German companies, require more formalised work routines, which, in turn, promote the employment of the highly qualified. And the highly qualified expect promotion prospects, requiring a good number of hierarchical levels. These complex relationships facilitate each other, but they do not necessarily imply each other. By contrast, in the much slimmed down UK companies responsibilities were pushed down to the lower levels of (supervisory) management and to teams and companies were much more careful that supervisors could meet much more demanding personal specifications and role expectations. In some circumstances, but not always, this favoured the appointment of graduates with relevant work experience to these positions.

Consequences for the qualification and motivation potential of workers and the personnel policies of the companies

The implementation of the new recruitment and selection policies have caused frustration and demotivation among those groups of (usually skilled) workers from whose ranks supervisors were traditionally drawn, with little differences between countries. Note, however, that other less formally skilled workers, most notably in UKM1, welcomed the way changes in the recruitment and selection processes opened up more opportunities for promotion for them, as well as for the more highly qualified. The processes were seen as more meritocratic than the traditional way of just looking for supervisors from the ranks of skilled workers. So these developments have different national implications in terms of the qualification potential of different groups of workers and the size of the pool of workers suitably qualified to work at the next level:

- In **German** companies (DM1, DM2) many workers may be doubtful of the benefits of having to finance their own continuing education and training without realistic prospects of promotion. This, in turn, could deplete the qualification reserves of companies in the long term, leaving companies with fewer policy options over time. Even in the short term, companies may experience difficulties in increasing the number of skilled workers given their bleaker promotion prospects, which may make engineering apprenticeships less attractive compared to either entering higher education or taking an apprenticeship in areas with apparently better long-term prospects.

- In contrast, the recruitment of the highly qualified to worker positions will improve the qualification potentials of workers in the **French** and **UK** companies as long as the promotion prospects of the highly qualified are seen as sufficient. However, this recruitment strategy is likely to diminish the promotion prospects of those with a suitable qualification below degree level (for example, the *Baccalauréat* or Modern Apprenticeship), which in turn may prevent people from embarking on this qualification route, designed to strengthen the qualification potentials of

workers. If the highly qualified are only recruited to more demanding worker jobs and those with prospects, a polarisation of workers may be the result, leaving those with fewer opportunities demotivated. However, a negative impact on continuing education and training is less likely to happen in French or UK case study companies compared to the German companies, as it is much more likely that the employer rather than the employee takes the initiative.

As previously discussed, there is a tendency among the highly qualified industrial supervisors to move on to other jobs allowing them to apply their specialist or technical skills in other contexts. Some company representatives, for example in Germany, regard the resulting high turnover as positive, as it prevents the build-up of a cardre of *Meisters* with considerable power and influence. However, the high turnover may have problematic effects on the stability of the working relationship between workers and managers, the quality and the depth of leadership experience the highly qualified may acquire and the continuity of operational management. The high level of turnover in production management positions may require more continuity on the lowest management level, thus hampering the introduction of lean management.

Furthermore, the skill deficits and the experiences of the highly qualified supervisors, together with the increased workload of managers in general, may in certain cases lead to a sub-optimal execution of certain functions (for example, personnel counselling in DM2) or to delegating certain functions to lower levels (DC, FC1b, DM2). Skill deficits vary, depending on factors such as the kind of initial education, the experiences and the training offered, and the demands of the job.

Consequences for the continuing education and training policies of companies
One consequence of the new recruitment and selection policies is that companies have to impart social and leadership skills to a great extent and technical skills to a certain degree for highly qualified supervisors. The extent to which these skills can at least be partly acquired through experience in a number of worker positions and internal knowledge of how the company operates depends to a large extent upon the range of skills required and responsibilities exercised in those roles. Perhaps indicative of the gulf between the skills demands between these different roles are the scale of the continuing education and training programmes for industrial supervisors in three French and one UK company (FC1b, FC2, FM, UKM2), lasting between one and a half and two years. The acquisition of relevant production experience and leadership skills requires substantial personnel management effort to organise the various stages of the training programme. The operation of such programmes also involves financial costs, even more so as a number of the highly qualified supervisors are likely to move on to other companies in the search for higher pay, better prospects and/or opportunities for further personal development if they do not receive further promotions. On the negative side, this leaves the companies having to train their replacements. On the positive side, in the UK case, those supervisors who are promoted internally will have received a much more thorough grounding in operational management as a preparation for the exercise of other general or specialist management responsibilities.

French and UK companies also need to create the prerequisites for their co-existence policy, that is, the provision of continuing education and training programmes for the traditionally qualified workers aspiring to a career in supervision and management. In

particular, workers may need support to develop their abilities to operate as effective learners. In the UK, companies now frequently encourage workers to return to formal learning through the provision of open learning centres and/or employee development programmes. The workers may also be able to take some less time-intensive modular programmes as a way to build up their skills, knowledge and formal qualifications prior to their appointment in any supervisory capacity. Such developments are deepening the skill base of the workers and widening the base from which promotions could be made: for the first time production workers are eligible for promotion through the supervisory chain.

Companies are being expected to promote the continuing education and training of their workforce. Where this was previously underdeveloped, as in many **UK** companies, employee development schemes have proved largely successful. However, in **German** companies, where the prospect of promotion to *Meister* and significantly increased financial rewards drove the continuing education and training system, the reduced promotion prospects may mean that the lifelong learning of workers will be hampered in the medium or long term. To counteract this, more initiative and investment on part of the companies will be required, as individual commitment to learning and development becomes less reliable as a driver of the continuing education system as a whole. The concept of 'competence development' is driving employee development in **France**, but insofar as it requires promotion opportunities to motivate workers where these are blocked off (as in FC1) the rationale for the system may be undermined.

9. Conclusions: significance, development potential and long-term consequences of substitution policies

The final objective of this cross-national report is to analyse the effects of the new recruitment and selection policies on societal developments. First, the future of worker careers will be discussed; second the effect of the substitution policy on the interrelation between education systems and recruitment policies of companies; and third - working on the assumption that substitution policies are on the increase - the consequences for education systems, continuing education and lifelong learning.

9.1 Substitution of worker promotion by the employment of the highly qualified as industrial supervisors: a radical change?

The results of the study indicate that substitution is neither to be overestimated nor to be underestimated, as the following sub-sections will show.

Manifold realities behind substitution data
It has to be recalled that substitution seems to be relatively limited reaching 4 per cent in Germany and 12 per cent in France according to available statistical data. Yet, these statistics comprise three different forms of substitution and only one of these should be regarded as a radical change.

Synthesis models - weak approaches and their implications
Combining elements of the traditional supervisor career development and the employment of highly qualified staff can avoid abrupt changes in recruitment and selection policies. There is considerable demand for such synthesis approaches, particularly in the UK, but in order to be successful four key principles need to be established:

- First, supervisory positions need to be accessible to workers with lower level qualifications to avoid many of the resultant problems of appointing exclusively highly qualified supervisors.
- Second, the qualification potentials (in the sense of being able to meet current and future requirements) of future supervisors need to be improved considerably to allow for adaptations to new skill demands.
- Third, the status of promoted workers acting as supervisors needs to be elevated to allow for competition for further promotion with the more highly qualified to be on an equal basis and to allow for the integration of specialised staff into production units.
- Fourth, supervisors who are promoted workers need to achieve a generally acknowledged qualification to facilitate movement between companies and to secure the attractiveness for workers of investing in their own career development.

In some of the companies studied a synthesis of the two competing access routes to supervisory positions can be found. But they do not always combine all of the four principles, and they may be fairly limited in scope. One UK company (UKM2), for example, offers comprehensive continuing education and training programmes for supervisors who have already earned a craft qualification. These programmes deliver a vocational qualification in supervisory management and open up the way for

possible progression onto an MBA programme. This form of synthesis scores highly in terms of principles (3) and (4), but it seems costly and therefore selective, and the company rather prefers a co-existence rather than a synthesis model.

Co-existence models - the dominant pattern and its perspectives
None of the nine companies have completely substituted traditional industrial supervisors by more highly qualified staff. Yet it cannot be ruled out that the co-existence of these two differently qualified groups may only be a temporary phenomenon as experience and knowledge needs to be passed on to the new type of production supervisor. Companies in some cases may also have legal obligations towards retaining their traditional supervisors since many may have been working with the firm for a long time.

Apart from the fact that some companies plan to increase the proportion of highly qualified supervisors, there are some other factors that may call into question co-existence as a policy in the medium or longer term. First, the highly qualified may be on a faster promotion track, thus reducing the chances of traditionally qualified supervisors being appointed to other more senior or specialist management positions. Second, as the job profile of supervisory positions converges more and more with the skill profile of the highly qualified, the traditional candidates could be regarded as more and more unsuitable for the job. And finally, at least in German companies, workers will be less committed to continuing education and training in view of the deteriorating position in relation to promotion opportunities.

9.2 Substitution processes: an irreversible cross-national development trend?

To assess the future of substitution it is also crucial to analyse whether the societal conditions and the company interests, leading to the new recruitment and selection policies, are likely to remain the same or undergo changes in the future. Many outcomes of this debate will be country specific, as the importance of substitution policies varies across the countries in which the companies investigated are located.

First, many companies covered seem to pursue substitution policies with the aim to implement new forms of production management in the hope of achieving higher productivity levels. The highly qualified seem to be more open to such changes and they are equipped with valuable knowledge and skills. Second, substitution processes appear at the end of longer-term developments of national education systems and their interrelations with employment systems. These developments vary from country to country, and are discussed in the full cross-national report (Drexel et al 2000), nevertheless some common ground can be found.

Weaknesses in the education and training of workers, shortages of suitable candidates for positions in production supervision and management, the lack of continuing education and training, and the need to strengthen the group as well as the status of industrial supervisors, all favour the establishment of substitution policies. There is also a complex connection between the new recruitment and selection policies and certain elements of a Taylorist organisation of labour, particularly formalised production management, a great number of hierarchical levels and a division of labour that is based upon the lower level workers exercising mainly low-level skills.

Furthermore, substitution policies are helped by a continuing supply of highly qualified entrants to the labour market and by the more practical alignment of much higher education, although companies could as well have opted for alternative ways of recruiting industrial supervisors. Weaknesses too in the mismatch between skill potentials and the changing duties of traditional industrial supervisors seem to have at least partly contributed to the establishment of substitution policies. But they cannot sufficiently explain them; instead the vested interests of companies in wanting to introduce more radical changes outwith substitution policies play a crucial role, as discussed earlier.

Third, further increases in substitution processes seem most likely to take place in the **UK**. The employment of graduates is already relatively widespread and graduates have got used to being initially recruited to a range of positions that are not normally considered as requiring graduate level entry, allowing them to gain practical experience vital to promotions to management positions. The revival of worker promotion, based on the development of Modern Apprenticeships, may have come too late. But it also needs to be considered that negative implications of too great a reliance on graduate recruitment may entail changes in recruitment and selection policies in future. In **Germany** a big expansion of graduate recruitment to supervisory positions seems least likely due to the low current level of substitution and the shortage of engineers. Nevertheless, some companies have indicated that they wish to employ more graduates in supervisory and other production-related management positions. Furthermore, the possible spreading of horizontal rationalisation strategies may favour substitution policies. The situation is less clear-cut in **France**. The significant improvement in the skill levels of workers as well as the companies interest in securing worker promotion in an effort to create internal labour markets do not seem to indicate the likelihood of any acceleration in the recruitment of more highly qualified industrial supervisors. Yet the extent of substitution policies also depends on the general labour market situation. Deteriorating job entry prospects of young school-leavers have contributed to the recruitment of higher technicians to worker positions in order to build up a reservoir of employees suitable for production management positions.

9.3 Substitution policies - a momentous process for education and employment systems?

It may be worthwhile to examine what would be the longer term effects on education and training, if the proposition that substitution policies are going to increase significantly in future proved to be well-found.

Substitution policies and the future of vocational education and skilled labour
The recruitment of the highly qualified as industrial supervisors needs to be seen in connection with the expansion of higher education. Yet this development alone cannot explain the rise of substitution, for two reasons. First, there are alternatives in that companies could offer initial vocational education and/or suitable continuing education and training to improve the supply of workers suitably qualified to act as supervisors or they might even recruit supervisors externally. Yet it needs to be admitted that the provision of such education and training by companies themselves could be relatively costly and difficult. Second, the expansion of higher education itself is a reaction towards the changed recruitment and selection policies of

companies, although there are differences in the development between Germany on the one hand and France and the UK on the other hand.

In the context of these developments promotion will become less and less likely for workers without higher level qualifications, particularly for those working in companies with flat hierarchies. In companies with many hierarchical levels a polarisation might take place between fast track and far-reaching promotions for the highly qualified and a relatively slow and limited progression for less qualified workers. The overall loss of promotion opportunities makes vocational education and training (VET) less attractive in countries like Germany where the VET system has traditionally been very strong, causing far-reaching consequences also for higher education. Whereas, ironically, the decline of VET from the 1970s through to the mid 1990s in the UK means that the job prospects for those entering the labour market now with intermediate level craft and technician qualifications are extremely buoyant in many occupational fields and geographical areas.

As the expansion of higher education is likely to continue, it might be thought that degrees will lose some of their relative value on the labour market with more graduates having to adjust their expectations about what constitutes a graduate entry level job. On the other hand, in the UK the relative advantage of graduates over those with other qualifications has remained wide precisely because so many jobs with reasonable pay and prospects now require graduate level entry. However, in Germany expectations about what constitutes a graduate job are more traditional, and if graduates have to accept positions below degree level this may cause unrest and higher levels of turnover, and initiate a search for better education alternatives. The state could be forced to provide more higher education places and to integrate practical training into the curriculum. Yet the experiences in Germany have shown that securing permanent co-operation of companies in practical training is difficult to achieve (Drexel, 1999). These outlined developments may lead to a vicious circle, allowing for fewer and fewer alternatives for all actors concerned (companies, employees and state-run education policy). This could continue until finally there is little chance of reviving the worker promotion path, as it seems no longer credible or feasible given the loss of motivation and commitment of workers to engage in their own further development. Unqualified production work would then be likely to increase, and skilled labour would lose much of its current importance.

Implication of substitution policies for continuing education and training and lifelong learning

It is generally expected that the highly qualified will learn faster than those with less formal qualifications. This may not necessarily reduce the extent of continuing education and training, but it may certainly alter its character. The introduction of new recruitment and selection policies has been accompanied by discrepancies between required and available skills of the highly qualified. One response has been the provision of quite extensive personal and continuing education development programmes to remedy the lack of experience and/or skills. These programmes are very much tailored to the individuals taking part. In some cases certificates are not issued at the end of the programme, thus impeding somewhat the possibility of labour market mobility, in that other companies could be concerned as to whether skills and competences would transfer to other contexts.

Employing highly qualified staff as industrial supervisors naturally reduces promotion opportunities for workers previously recruited to these positions. These workers will lose incentives for engaging in continuing education and training and/or lifelong learning. This will particularly affect Germany, where workers might enrol for comprehensive continuing education in their late twenties or even up until their forties. Consequently, more emphasis will need to be put on initial education undergone before entering working life or shortly thereafter. The vision of lifelong learning will then be reduced to a range of short courses necessary to develop the appropriate skills. In contrast, employing more highly qualified staff as industrial supervisors in the UK seems part of a much more general movement to upgrade the skill levels of all employees. Continuing education and training, and the need to combine learning and working, are becoming more important, although it should be remembered that many UK companies were starting from a very low base in this respect.

So, while in Germany substitution policies threaten to undermine and destabilise processes that have led to substantive commitments of individuals to continuing education and training, in the UK substitution policies seem indicative of a broader trend, applicable to both companies and individuals, to strengthen commitments to continuing education and training.

10. Conclusions pertaining to education and personnel policies

For various reasons, no specific cross-national conclusions can be drawn with regard to education and personnel policies. The extent to which worker promotion is affected by substitution is very different in the countries covered. Furthermore, substitution processes play a different role in the development of education and employment systems. And finally, the principles of educational policy and the assessment of substitution processes are very much affected by national traditions. Therefore, only a few fairly general cross-national conclusions can be formulated.

10.1 Cross national conclusions

First, when appointing highly qualified people as industrial supervisors, there are indeed ways allowing - to a certain extent – for the substitution of many years of work-based experience, typical of traditionally qualified industrial supervisors. First, production experience can be gathered in a compressed way as part of periods of practical training during study (UK) or as part of internal education and training programmes after completing the study (France). In the UK mature graduates will also have often gained production experience prior to entering higher education, or if they are taking part-time degrees they will continue working while learning. In these cases, it is misleading to portray highly qualified supervisors as necessarily lacking relevant work experience. However, in the French cases the higher technicians are likely to be younger and to have less relevant prior work experience. As discussed earlier, mounting special training programmes for the highly qualified will require additional resources in terms of establishing and running the programmes, and the highly qualified may still not get the necessary depth of experience. Employing the highly qualified for some years as workers (as in the UK) seems to be a better way of preparing them for their role as industrial supervisors. However, the implications for the attractiveness of education and career pathways of the substituted groups need to be weighed up against the required resources, opportunities and possible consequences of alternative solutions.

Second, if the aims of national governments and the European Commission to strengthen systems of vocational education for workers and to promote lifelong learning are to be realised, the implications for current career pathways need to be considered. In Germany and France, attempts should be made to ensure existing career pathways remain open, and opportunities for progression are at least equal to those currently available. In the UK the emphasis should be to reinforce current moves to extend the type and numbers of workers who could be considered for promotion beyond the traditional reliance on those holding craft qualifications. In view of the competition from the highly qualified, existing career pathways for workers therefore need to be widened and strengthened. Depending on national conditions, there are different necessities and possibilities, but also some basic common conditions, as touched upon earlier.

One way to strengthen the prospects of worker promotion is through the curricular improvement of initial worker education – either by improving existing courses or by creating new, higher status ones – and to increase the prestige of these qualifications. In Germany, this means the renewal and re-invigoration of the dual system underpinning apprenticeships. However, such a strategy might carry risks if, at the

same time, the highly qualified were allowed to access senior production management positions more swiftly than promoted supervisors. An alternative way to strengthen the prospects of worker promotion is to extend opportunities for continuing education and training to all employees, as in France and the UK.

The viability of a co-existence policy would seem to depend upon the particular company contexts in France and the UK. In some contexts it was felt that, based on previous experience, the co-existence policy was sustainable on a permanent basis, although there may be risks for worker education, training and competence development if the acquired competencies were not recognised and, in some cases certified. Co-existence policies in Germany, however, would raise far more serious systemic questions. For example, the viability of a permanent co-existence policy was doubtful, particularly if the number of highly qualified reached a threshold, such that the attractiveness of initial education was negatively affected, endangering also new forms of vocational education and training. It is also assumed that the skills requirements for production management positions will, in the long term, converge with the skills profile of the highly qualified, thus leaving promoted supervisors to be seen as less suitable for the job.

Another prerequisite for strengthening prospects for the promotion of workers to industrial supervisory positions are demanding and prestigious continuing education and training programmes, covering technical, social and increasingly commercial aspects. In order to safeguard mobility within and between companies these programmes need to be certified and accepted in the labour market. Furthermore, additional new and attractive career pathways, not necessarily hierarchical ones, are necessary to strengthen the motivation to undertake continuing vocational education and training. Without such additional career paths the attractiveness of continuing vocational education and training will decline, prompting people to put more emphasis on initial education in an effort to secure occupational and social promotion early on. Under such conditions, lifelong learning will become an empty phrase or synonymous with skills adaptations initiated by third parties. In order to create new and attractive career pathways all stakeholders concerned at company, society and state level need to work closely together.

10.2 Conclusions for France

The aim to raise considerably the qualification level of the labour force is rooted in the principles of equal opportunities, vital to French society. In principle, this policy, having become more prominent since the 1980s, has led to a closer link between the level of qualification and the level of the first position after completion of education. Concurrently, this relationship was raised to a higher level due to increased skill demands in production. Thus, there is a tendency that workers now need qualification level IV (*Baccalauréat*) instead of previously level V (*CAP* and *BEP*). The category of the *agents de maîtrise* illuminate the development of the qualification structure in France, and demonstrate the boundaries and contradictions associated with too close a relationship between levels of education and employment.

The big French companies recruit more and more often higher technicians with a *BTS* or *DUT* qualification to industrial supervisory positions. This goes to show that the major players have a tendency to raise qualification levels, by institutionalising a

correspondence between the qualification level of higher technicians and supervisory positions, similar to the correspondence between the level of the highly skilled worker and the *Baccalauréat Professionnel*. These two qualifications carry a different status in the education hierarchy and they are part of different education pathways. Those with a *Baccalauréat Professionnel*, which is part of the vocational education system, are at a disadvantage when it comes to competing with others for supervisory positions. This situation contradicts the intention to enhance the status of vocational education, which led to the establishment of the *Baccalauréat Professionnel* in the 1980s.

The employment of higher technicians as industrial supervisors causes problems pertaining to the career pathways of the workforce. In France, particularly in large companies, internal career pathways are very important. This is particularly true for access to industrial supervisor positions, for which work experience was and will also in future be regarded as an important prerequisite. Workers are most affected by such a substitution policy. According to the results of the French study, the executive management of large industrial companies frequently opt for co-existence strategies, thus keeping options for worker promotion open. Such a policy seems feasible as it reproduces the heterogeneity, characteristic of the composition of industrial supervisor positions. However, worker promotion is affected by problematic selection and competition mechanisms, despite the fact that the pool of qualified workers has increased, due to a rise in their qualification level.

In this context two observations, drawing on the case studies, are important.

- In France, difficulties to create a pool of workers suitable for taking over industrial supervisory positions are due more to an insufficient rejuvenation of workers than to a lack of supply on the external labour market, as is the situation in the UK. It is hoped that the increasingly active recruitment policy of companies, following new legal regulations and better economic conditions, will lead to an increased recruitment of young people.

- Second, in connection with the policy of increasing the value of initial education, no continuing education and training courses were promoted or created that led to certificates that were accepted in the general labour market. In particular, there was a lack of continuing education and training programmes preparing people for industrial supervisory positions, like for example the *Meister* qualification in Germany. On the one hand, the French system of continuing education and training, de facto unique in Europe due to the commitment of companies to fund continuing education and training, is still not very important when it comes to giving support to individuals in their efforts to gain further qualifications. On the other hand, the extensive investments of companies in continuing education and training of industrial supervisors is hardly visible to the outside world. This puts individuals dependent upon the recognition of continuing education and training and mobility between companies at a disadvantage.

However, this is not to say it would be appropriate to recommend the creation of continuing education and training courses, similar to the German *Meister*. Such an aim would contradict the development of the French education system and the existing principle that every qualification can either be acquired as part of initial or

continuing education - a principle that de facto favours initial education. However, in the wake of policies putting more and more emphasis on certifying qualifications, new instruments have been created, that are predicated upon certifying work-based competencies. They comprise the so-called *CQP* (*Certificats de qualifcation professionelle*), based on the certification of qualifications by a branch of economy, and the validation of knowledge acquired via work experience, which is soon to be newly regulated. If these instruments are to be generally applied in future, they might further the promotion of workers to industrial supervisor positions and their opportunities to change employers.

But the career prospects of higher technicians can also be capped. This is due to the limited scope of career paths for intermediate occupational groups and the limited opportunities they have to move on to higher management levels, as it more and more likely that those positions are reserved for engineers in the case of production departments. However, restrictions in career progression do not seem to be compatible with the aim of companies to further develop competencies of individuals, unless more varied and possibly horizontal career pathways are established.

The current recruitment and selection policies for industrial supervisors are expected to have even more negative consequences for the attractiveness of vocational education. This is because it may become more difficult to create the conditions that would allow each employee to improve his or her skills and competencies throughout his or her whole working life by embarking on one of the work-based qualification routes mentioned earlier. These conditions can only be created by a strong political will that includes support from the state and the social partners.

10.3 Conclusions for Germany

The results of the German study suggest a range of conclusions, going beyond or specifying those made earlier in the cross-national section. Due to the prevalence of the dual system of initial skill formation many - but not all - German companies have established three key conditions for the continuity of worker promotion to industrial supervisory positions:

- (very) well qualified skilled workers in great numbers;
- an increasing number of younger employees combining initial vocational education, work experience and completion of a demanding programme of continuing education and training; and
- a tradition of self-initiated continuing education and training prior to promotion.

All three of which cannot be taken for granted as comparisons with the other countries covered show. Promotion opportunities leading to *Meister* positions are a prerequisite for an active and functioning system of high level initial education and training. Opportunities in German education, training and employment have at least until very recently seemed relatively well-balanced in a high skills equilibrium (Finegold and Soskice, 1988). Particularly when comparing countries, the relative strength of the German vocational education and training system in the advanced manufacturing sector becomes evident and this underpins the strategic role that the combination of initial and continuing education and training plays for worker promotion. Against this background, substitution policies do not seem to be systemically necessary, rather,

they seem to be a consequence of special conditions and/or the personnel policy aims of specific companies.

Although the current weaknesses of the inter-relationships between education, training and employment German system should not be underestimated, they are not the only (and not even the central) cause for substitution processes, but they are nevertheless important. Certain weaknesses become apparent at the lower and the upper rims of the *Meister* qualifications. In many cases there is an insufficient or heterogeneous qualification level amongst workers and/or industrial supervisors, causing the need for action in how initial and continuing education policies are implemented in companies. Being qualified as a skilled worker and subsequently as a *Meister* is nowadays seen in Germany as the minimum prerequisite to meet the current and future requirements of working in the organisation and management of production.

It is the combination of the technical and pedagogic elements, which are central to the German *Meister* qualification, and strongly related to how production has been traditionally organised in German companies to make use of relatively highly skilled labour that makes this approach distinctive. However, the increasing integration of specialist and production departments itself creates new hierarchies and subordinate relationships. As a consequence, traditionally qualified *Meister*s will find it difficult to compete with engineers on status and qualification grounds. Presumably the only way to safeguard worker promotion is for workers to take part in education and training programmes beyond the *Meister* qualification, to achieve qualifications carrying a similar status to engineers in these specialist departments. This situation calls for action on part of companies and the state, if both want to sustain worker promotion under these circumstances.

There are a number of compelling reasons in the German context for sustaining worker promotion. The loss or reduction of pathways for promoted workers will have a negative effect upon the relative attractiveness of vocational education and training and may cause a decline in self-initiated continuing education among workers, keen to work their way up into the management. Yet it is the latter who are crucial to the replenishment of the pool of qualified workers suitable for the promotion to industrial supervisors (or specialised positions). Recruiting engineers to industrial supervisor positions in greater numbers may also make engineering studies less attractive for following cohorts of students, if they believe their graduate skills will not be fully utilised (nor rewarded to the level they were expecting). Furthermore, the relatively high level of turnover of engineers in *Meister* positions might in many cases be seen as equally problematic. If engineers fear that aspects of their core knowledge may become obsolete as the nature of the job as a supervisor does not allow them to apply some of their core skills, they are more likely to regard such a position as just a transitional stage.

In these circumstances opting for a co-existence of traditional and new access routes to supervisory positions seems less reasonable, due to the serious implications of substitution processes for the central drivers of German vocational education and training policy and practice. A co-existence policy cannot avoid the consequences of substitution, and it is questionable whether it can be sustained permanently for three reasons. First, workers might have to give up or realign their career ambitions and

their investment in continuing education and training following the deterioration in their career prospects. Second, job requirements for industrial supervisors are likely to be increasingly realigned to the skill profile of engineers, thus further increasing substitution. Third, companies will have fewer opportunities to take countermeasures if fewer and fewer workers take self-initiated *Meister* qualifications.

In the medium term, nearly all companies will be affected by the implications of substitution policies. This is as well as these policies creating problems for the smooth functioning of the education and training system as a whole. If promotion prospects deteriorate in an increasing number of companies, so the attractiveness of the dual education system as a whole will suffer. Therefore, drifting and just hoping that co-existence policies work out is not really an option. More promising are strategies aiming to improve continuing education courses at *Meister* level and to introduce a synthesis model allowing skilled workers to access industrial supervisory positions and to continue to develop higher level technical, organisational and perhaps commercial skills and work towards additional higher status qualifications.

In principle, there are three types of a synthesis of both access routes, each of them with associated problems:

- skilled workers studying for an engineering degree (FH) via the 'second chance education' route. But more and more young people having completed the *Abitur*, the German equivalent to A-levels in the UK, now decide to complete an apprenticeship and then to study full-time for a degree. Therefore this path loses importance for promotion.

- people with a *Meister* qualification studying for a relevant FH degree.
  However, this relatively recent option has hardly been used in practice, indicating some difficulties in terms of the learning culture and/or financial issues.

- people with a *Meister* (or technician) qualification with several years of work experience qualifying as *Technischer Betriebswirt* (technical management expert). This qualification conveys knowledge on organisational issues, business economics and economics. Due to the alternating forms of learning and working and the openness of these continuing education institutions for employees without the *Abitur*, this access route seems to serve the concept of a synthesis of the learning processes under investigation best. But it remains an open question whether companies will accept this qualification as readily as they accepted the (FH) engineering degree.

There are few (recent) research results on these access routes and their function for supporting or strengthening career pathways for promoted workers. If the problems indicated above could be solved, the promotion of these access routes could be an important starting point for political action.

Flatter hierarchies and the rationalisation of *Meister* positions that go with it have drastically reduced promotion opportunities of workers. Therefore, new horizontal career patterns are necessary to safeguard worker promotion pathways. These career patterns should combine changes and improvements of work content and pay in the course of a working life. In order for these new career patterns to be binding and attractive for workers, they would need to be negotiated between the social partners

and flanked by education and training measures. In this context, the Germans can learn from the attention French companies and social partners pay to career patterns within companies. However, in Germany the public recognition of these career patterns and the supporting education and training measures would be necessary to make them competitive with established qualifications. New career pathways are also necessary to avoid the waste of the qualifications, experience and motivation of workers who are laid off or relocated. Ad-hoc solutions, such as the relocation of former *Meister*s to production planning, seem insufficient in view of the scale of the rationalisation process.

In the light of the results from France, Germany and the UK, it seems evident that German discussions in favour of making the dual system of education and training more flexible, or even abolishing it, downplay the potentially negative consequences of such a change. Particularly the UK example of replacing substantive vocational education and training for a system relying upon the assessment of ('somehow') acquired competencies at work illustrate the considerable negative consequences not only for workers, but also companies, particularly those who are not content to rely upon low-skilled production methods. German public debates on education policy increasingly accept the argument that a regulated initial education and training and continuing education and training system is not really necessary and that there are indeed more flexible and more economic models, as the examples of the UK and the USA show. However, this argument needs to be replaced by more information on the resulting problems and financial implications for all players concerned, including society and companies, and even more crucially how these models align with very different patterns of work organisation.

Equally, the widespread argument that Germany needs to bring its education system in line with other European countries does not really seem justified. Such an adaptation would be problematic, not least due to the variety of education systems in Europe, and their differing inter-relationships with work place structures and company policies. It is also unreasonable given the considerable, if different, problems many other European countries have with their vocational education and training systems. For example, England and France have tried for more than a decade to integrate elements of the German dual education system into their vocational education system to solve their structural problems. The situation in England is particularly instructive. In the middle 1980s there was an attempt to set up new qualifications explicitly modelled on the German *Meister* qualifications that workers would take prior to their appointment as supervisors. These qualifications were to be the outcome of very demanding continuing education and training programmes designed for specific industries and taking approximately two and a half years to complete. However, the attempt failed, primarily because of problems of 'poaching' by other employers, as these workers had highly marketable skills, given the historic relative under-qualification of intermediate level employees. Therefore the provision of a whole range of more general smaller-sized supervisory qualifications (without the technical content typical of the *Meister* qualifications) that can be taken step by step today seems the only solution left. This shows that changes are far more likely to be successful if they take account of the particular cultural, economic and organisational contexts in which they are being introduced, rather than being imported wholesale from other countries. Therefore, when taking into account the historical and current context of the operation of substitution policies in France and the UK, then a transfer

of such polices to Germany seems, in general, less reasonable.

10.4 Conclusions for the UK

10.4.1 Use of National Skills Tasks Force results and other studies as a context against which to view the UK findings

Parallel to the UK study the Department for Education and Employment commissioned a national study, which was to support the development of a National Skills Agenda. The remit of the Skills Task Force was to advise on the types, volumes and structures of qualification demands and deficits. As a consequence, the Skills Task Force commissioned a thorough investigation into national skills deficiencies, the results of which will be used, together with other recent research findings, to outline the context relevant for the evaluation of the UK findings of this project.

In general, a low skills equilibrium continues in much of the manufacturing sector. Lloyd and Steedman (1999) suggest that there is little demand for intermediate qualifications across many branches of economy, despite a polarisation of skills in some areas and skills shortages. In the UK, more graduates have taken over positions, which in other European countries, particularly Germany and the Netherlands, would be filled with staff with intermediate level qualifications (Lloyd and Steedman, 1999). This is particularly important for our study, as technicians promoted to supervisors may already be graduates. Hence graduate substitution policies have far less political significance at company level than in those countries in which there is a strict differentiation between jobs at graduate and intermediate qualification levels.

There is weak employer demand for intermediate level skills and equally a low supply of employees with these qualifications (Lloyd and Steedman, 1999). Decisive in this context is that employers have adjusted to this situation, and may also have adapted their product market and personnel strategies accordingly. This applies to companies with low skill demands and low quality products as well as firms operating in markets with high skill profiles. This may be due to the fact that increasing skill levels is only one of many prerequisites for success in markets with high added value (Lloyd and Steedman, 1999).

Mason (1999) argues that there are serious structural weaknesses in the system of engineering training in the UK, as the long-term trends observed in the past three decades regarding the level of recruitment and training indicate structural rather than cyclical weaknesses in British system of engineering training. New institutional arrangements and incentive systems could not convince employers to support long-term engineering training consistently through each phase of the business cycle. Again, employers seem to have adjusted to this situation, as only one third of employers report discrepancies between the qualifications of their workforce and the qualification level necessary to achieve the company goals (Mason, 1999).

Due to changes in markets and work organisation, engineering employers now have higher expectations of graduates than that was generally the case with former generations of graduates: increasingly engineering graduates are expected to have interpersonal skills and the ability to communicate at high level. Difficulties in recruiting engineering graduates are generally more related to deficits in the quality of graduates - such as a lack of work experience and under-developed social skills - and not primarily due to a lack of supply (Mason, 1999). It seems advisable under such

circumstances to opt for a further strengthening of the connection between general education, training and employment in order to guarantee the development of technical knowledge and skills alongside interdisciplinary competencies. The aerospace industry for example promotes work-based learning by offering graduate apprenticeships, whereby work experience and higher education are interrelated.

There is a remarkable contrast between structural deficits found at intermediate level education and the conspicuous successes of the higher education sector. In the last three decades participation in higher education has tripled. Higher education has become increasingly diverse and is open to students with different qualification backgrounds. The UK has one of the lowest drop-out rates of OECD countries (HEFCE 1999), and it is expected that 80 per cent of HE entrants will gain a degree. In contrast to intermediate level qualifications supply and demand of graduates is high. According to Elias et al (1999) only just 10 per cent of graduates are not in career-related employment level three-and-a-half years after completing their study. However, this percentage continues to drop in subsequent years, indicating that under-employment for most graduates is of a temporary nature. The impression of a significant non-graduate level employment may also be the result of cultural differences. After just three years of study British graduates seem relatively under-qualified, compared to for example their counterparts in Germany. Jobs requiring higher education may therefore start at a lower level in the employment hierarchy. Most associate processional jobs, for example, are now a graduate domain in the UK.

According to Mason and Wagner (2000), the superiority of German companies in traditional branches of industry, such as mechanical engineering and the chemical industry, partly based upon the comprehensiveness of their initial and continuing vocational education and training, contrasts with less impressive results in fast changing industries, such as telecommunications. The reverse is true for the UK, where the telecommunications industry is much more successful than mechanical engineering and chemical industry. Mason and Wagner (2000) argue that the high degree of individual mobility of highly qualified scientists and engineers contributes to the spread of tacit knowledge and experience as well as aiding co-operation between companies. In a highly dynamic environment the exercise of responsibility at work, the experience of changing contexts and working with others to tackle demanding tasks result in significant non-formal learning. Getting young graduates quickly into the labour market and moving them through a succession of challenging of varied jobs early in their career means they are likely to be more mobile, flexible and experienced than those who spend more time in initial education and service with a single employer. The driving force behind the first model (UK situation) is work-based learning and the motor of the second system (German situation) is preparation for an occupation. There is no definite judgement over which system is better. Each has relative weaknesses in some areas and relative strengths in others. This is clearly demonstrated how, in the absence of a comprehensive system of vocational education and training in the UK the use of graduate labour, labour market flexibility and informal processes of knowledge transfer can lead to innovation and dynamic performance in high-technology industries.

The above makes it apparent the extent to which particular approaches are situated within specific contexts. For example, in those UK companies that typically organise production around the flexible use of mainly semi-skilled labour and put increased emphasis upon teamwork, for the team coach it is the combination of pedagogic and

social skills that are central, even if this means downplaying the importance of technical skills for this group. To attempt to apply such a model in traditionally organised German companies would almost certainly cause problems at work. Indeed Finegold and Wagner (1999) point out German companies producing diversified quality production, using the abilities of highly skilled workers and engineers, are using a system that is essentially based around individual performance, and hence any shift towards multi-functional team working is likely to be problematic. While some UK companies emphasise pedagogic and social skills, this contrasts with the combination of the technical and pedagogic elements that are drivers of the German *Meister* system.

10.4.2 An example of how to combine opportunities for skilled workers with opportunities for graduates to work in 'new' supervisory roles

One of the UK cases studies has provided an interesting example of how the employment of skilled workers and graduates as 'new' style supervisors can be combined. The company has tried to create a balance between stability and new ideas, change and continuity by mixing 'anchors' and 'new blood', that is skilled workers and graduates, in filling the 'new' supervisory role of team coach. Selection was not made simply on an individual basis, rather, as a group, team coaches had to meet the following requirements: thorough knowledge and understanding of work processes, technical knowledge, interpersonal skills, ability to communicate and ability to move into new roles.

Most 'traditional' supervisors could meet the first two requirements, but they believed supervision was mainly about control, and they did not possess the interpersonal skills and the ability to communicate necessary to support teams. Only two supervisors were able to adapt successfully to the changes that meant interpersonal skills and the ability to communicate were the essential characteristics for the 'new' supervisors rather than understanding of the work process and technical knowledge. This shift in job requirements therefore opened up new career opportunities for groups other than just skilled workers. Experienced semi-skilled workers with a profound knowledge of work processes and social skills could now be promoted to team leaders and finally team coaches. In the past, this route was reserved for skilled workers with relevant technical knowledge.

This mixed approach provided some stability in that experienced workers, who could be skilled or semi-skilled, with well-developed work process knowledge could act as anchors for the experience-led practice. Their employment, in turn, gave scope for the recruitment of graduates with new ideas and more extensive technical knowledge to other 'new' supervisory positions. This mixed approach therefore explicitly sought to provide both continuity and change, an appreciation of the value of experience with a recognition of the value of fresh ideas.

However, graduates with a technical background and well-developed interpersonal skills and the ability to communicate are not easy to recruit because they are in high demand. In an effort to increase their chances to attract such graduates, the company offers them individually tailored personnel development programmes, allowing graduates to move on to expert or management positions after some years of working as a team coach. The company benefits from graduates capable of taking on new tasks in three different ways. First, the role of team coach is continually refreshes with

people with new ideas and technical expertise. Second, this provides a grounding in work process knowledge for people who will move into specialist roles in future and this experience could have real benefits in how they carry out those future roles. Third, it hones the communication skills of both 'types' of team coach, as they need to learn to share knowledge, experiences and ideas from different contexts.

10.4.3 Relationships between education, training and employment experience and future career pathways of industrial supervisors.

In the relatively unregulated UK labour market we can be fairly sure that there will be a wide variety of ways that industrial supervisors will build up the skills, knowledge and experience to equip them to carry out their roles in future. It is therefore important that UK policies for VET and HE are sufficiently flexible to support the development of detailed knowledge and understanding of working processes; technical knowledge; inter-personal skills and communication skills in a variety of ways as well as facilitating continuing learning through work and opening up the possibility of future progression. That VET and HE can offer a wide variety of opportunities for learning in different education, training and employment contexts means that prospective industrial supervisors can develop the skills, knowledge, understanding and experience they require in almost any order, at any time and through a mixture of formal and non-formal learning.

This flexibility in labour market, employment, education and training structures is mirrored in the variety of ways prospective and practising industrial supervisors can get their skills, knowledge and understanding formally accredited. Technical, general (academic), management and specialist supervisory qualifications may all be relevant, and these could be taken as short courses lasting a few days to programmes lasting three or more years, with the educational level ranging from level 2 through to Masters level. It should be remembered that the goal is more knowledgeable and highly skilled supervisors rather than more highly qualified supervisors per se. Industrial supervisors now come from a much wider set of backgrounds than twenty years ago, they are better equipped to carry out their roles and VET and HE can offer flexible support for their continuing development.

What are the implications of this example for supervisors' development in the UK as a whole? Due account should be taken of the fact that because of the relatively unregulated labour market in the UK, supervisors in industry have a range of opportunities to acquire the abilities, knowledge and experience, required to equip them to carry out their roles in future. Therefore, UK vocational education and training policies need to be sufficiently flexible to support the development of the five key processes mentioned earlier in varying combinations of education, training and work:

- thorough knowledge and understanding of the relevant work processes;
- technical knowledge and expertise;
- well-developed interpersonal skills;
- ability to communicate; and
- the potential to move into new roles.

If vocational education and training can offer a variety of learning opportunities and contexts, including work-based learning, then potential supervisors can acquire the

required abilities, knowledge and experience in nearly any order, at any time, resorting to either formal or informal learning processes. The flexible structures of the labour market and in education, training and employment are being reflected in the variety of opportunities supervisors have to get their abilities, knowledge and experience formally recognised. Course duration may range from a couple of days to two or three years and qualifications may range from level 2 to MBA. Technical, academic, management and specialised supervisor qualifications can all be relevant. However, it needs to be kept in mind that the aim is to get more supervisors with a broad knowledge base and comprehensive abilities and not more supervisors with a higher qualification level per se. Careers of supervisors are nowadays more varied than twenty years ago. They are better prepared for their jobs, and they can embark on flexible continuing education and training programmes.

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Appendix

List of Abbreviations [Qualifications in italics]

Bac	*Baccalauréat*
Bac+2	*Baccalauréat* followed by two years further study at undergraduate diploma level
Bac Pro	*Baccalauréat professionnel*
Bac Techno	*Baccalauréat technologique*
BEP	*Brevet d'études professionnelles*
BIBB	Bundesinstitut fuer Berufsbildung (Federal Institute for Vocational Education)
BTS	*Brevet de technicien supérieur*
CAP	*Certificat d'aptitude professionnelle*
CBI	Confederation of British Industry
CGLI	City and Guilds of London Institute
CQP	C*ertificat de qualifcation professionelle*
DUT	*Diplôme universitaire de technologie*
INSEE	Institut national de la statistique et des etudes économiques
FH	Fachhochschule, equivalent to the former British polytechnic
HE	Higher Education
IAB	Institut fuer Arbeitsmarkt und Berufsforschung (Institute for Labour Market and Employment Research)
MEng	*Master of Engineering*
NEBS	National Examining Board for Supervisors
NEDC	National Economic Development Council
TL	Team Leader
UK	United Kingdom