

# **Good-practice-report of qualification and personnel development concepts to avoid/reduce the shortage of skilled workers in the producing sector**

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LEONARDO DA VINCI project SOS: “Shortage of Skilled Workers”

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# 1. Introduction and background

## 1.1 Background

Despite the continuing levels of unemployment, filling vacancies for qualified manufacturing activities in the metal and electrical industries can frequently prove extremely difficult right across Europe. Demographic change will further exacerbate the existing shortage of skilled workers within this sector. Particularly in relation to the field of highly qualified workers, a number of European countries are even reporting that the situation has already reached an alarming level. Similar developments are also apparent at a skilled worker level at the manufacturing sector, although the problem cannot yet be described as universal.

The “Shortage of Skilled Workers” project addresses the issue of whether there is a shortage of skilled workers at a specialist level within individual European countries and also seeks to identify the precise nature of such a shortage. The project forms part of the Leonardo Project<sup>1</sup> and involves the cooperative participation of partners from six European countries. The aim is to develop human resources instruments within companies at the level of well qualified skilled workers for the purpose of preventing and/or overcoming the shortage of skilled workers. Alongside personnel development concepts and career and training plans, in-company know-how transfer, in-company initial and continuing training and internal and external human resources procurement strategies constitute important areas to be addressed within the scope of the project.

The necessity of new strategies aimed at fulfilling the requirements for skilled workers is apparent right across Europe. The key is to develop concepts which are sustainable at both a political and company level.

The present publication highlights selected company strategies for the purpose of avoiding or reducing the shortage of skilled workers at a specialist level in respect of manufacturing activities in the metal and electrical industries in Austria, the Netherlands, Italy, the United Kingdom, Slovenia and Germany. Occupational research in-company case studies in companies of varying sizes are used as a basis to highlight the approaches adopted in reacting to existing or expected shortages of skilled workers. Companies which display good practice and are implementing forward-looking strategies and innovative concepts to enable them to be able to address their ongoing and impending skilled worker shortages have been selected. The focus was on small and medium-sized enterprises within the sector who have distinguished themselves by dint of adopting timely and innovative measures.

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<sup>1</sup> The project is financed via European Commission funding and via funds made available by the project participants themselves.

## 1.2 Methodological approach

Comprehensive sectoral analyses within the participating countries formed the starting point for investigations. Sectoral analysis is an occupational research tool for the precise exploration of a given sector (cf. Rauner/Spöttl/Olesen/Clematide 1993; Blings/Spöttl/Windelband 2002; Windelband/Spöttl 2004, Spöttl 2005, Windelband 2006) and represents an instrument via which information on the organisational structure and economic significance of a sector, employment within the sector, the delineation of the sector, the structure of skilled workers, the situation of occupations and occupational domains and so forth may be gathered. Surveying information in respect of training occupations (genesis, training figures, development, venues etc.), the specific skilled workers situation, relevant stakeholders (experts, researchers, lobbyists) and interesting objects of research (“good practice” companies, innovations) is also necessary in terms of undertaking systematic preparations for more deep seated investigations and securing the representativeness of samples for the deployment of qualitative research methods (cf. Becker/Spöttl 2006, p. 10).

Interviews with key persons and experts from within the sector, the evaluation of statistics (employment and training figures, vacancies, the skilled workers situation) and academic research publications on the shortage of skilled workers all enable companies already deploying measures and strategies to reduce the shortage of skilled workers to be identified and selected.

The instrument of the case study assisted in selecting and exploring the activities of companies in all six European countries. The aim of the case study was to identify companies within the investigation which are already implementing forward-looking approaches for the fulfilment of skilled worker requirements. The selection of the companies was based on particular criteria (sectoral affiliation, size of the company, innovative character of the company, specific skilled workers situation, the implementation of innovative approaches and measures aimed at fulfilling the requirement for skilled workers<sup>2</sup>), the results of the sectoral analysis as agreed with all project partners and experts from within the sectors. With it the purpose of securing comparability of investigations between the individual countries constituting a further basis was pursued. The project was able to select a total of 17 approaches in the participating European countries<sup>3</sup>.

Detailed specialist interviews were conducted with various target groups (management, human resources management and skilled workers) on the premises of the companies selected. The interviews with specialists were carried out in the workplace and were developed into expert discussions where appropriate. Expert discussions are to be viewed as semi-structured specialist interviews. This enabled

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<sup>2</sup> It was not possible to survey the measurable success achieved by the measures and approaches within the companies.

<sup>3</sup> There is cognisance of the fact that the implications of the shortage of skilled workers are extremely varied in some cases.

information to be gathered as to the particular situation in which a company finds itself, whilst the specialist interviews allowed the elicitation of whether the situation in respect of the requirement for skilled workers was evaluated in a similar way by the skilled workers themselves and whether measures for this target group were actually being implemented. The findings from the case studies form the basis for the recommendations described in the present publication.

The recommendations presented display only a small section of the multifarious approaches being adopted within the sector. Although this renders the study unrepresentative, the aim is to highlight pragmatic possible solutions for companies and to encourage other companies to develop their own appropriate strategies for the reduction of the shortage of skilled workers in the manufacturing sector of the metal and electrical industries in Europe.

## **2. Problem areas for the shortage of skilled workers**

The case studies and sectoral analyses conducted in six European countries enables the identification of some areas where there is a considerable shortage of skilled workers at a specialist level. A particular level of demand existed in respect of milling machine operators, industrial mechanics, mechanical engineers, tools mechanics, mechatronics fitters, electronics technicians and fitters. Some companies also reported considerable problems in finding trainees for these occupations. Such a shortage is already causing extensive loss of production in some of the companies investigated, as the following quotation from a company stakeholder makes apparent.

*“Our staff shortages mean that we are unable to move to a double shift system” (quotation from the Head of Production at a medium-sized engineering company in Germany).*

Despite the company related findings stated, it has hitherto been extremely difficult to discern a shortage of skilled workers at a specialist level in overall economic terms. Nevertheless, an increasing number of problem areas indicating a specialist skills shortage at a regional level and from the point of view of individual companies are becoming apparent. Nine problem areas which were able to be identified within the scope of the project on the basis of the sectoral analysis and of the results gleaned from the company case studies will be presented below. These should be viewed as correlatives of the shortage of skilled workers and will be depicted in relation to their possible causes<sup>4</sup>.

### **1. Lack of students/trainees selecting a technical course of training**

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<sup>4</sup> The individual problems areas are not always precisely delineable and are inter-related. For this reason, minor overlapping of the problem areas may occur. There is, however, no other way of achieving the most comprehensive description possible.

2. Lack of technical training opportunities
3. Trainee recruitment problems
4. Decrease in training numbers
5. Recruitment of specialist/skilled workers
6. Securing the supply of specialist workers within a company
7. Skills deficits at a specialist level
8. Training deficits in schools (curriculum, conditions)
9. Attitude of companies towards initial and continuing training

The individual problem areas and their possible causes in terms of the emergence of a shortage of skilled workers in the manufacturing sector are presented below. The relevance of the individual causes in the six European countries participating is depicted in tabular form. Evaluation was carried out by the project partners involved on the basis of their own national empirical findings. This made it clear that the relevance of the problem areas and their causes were in some cases subjected to various evaluations in terms of weighting and the degree of relevance ascribed.

### **1) Lack of students/trainees selecting a technical course of training**

From a more socio-political point of view, various causes for this problem situation were identified in the European studies. One possible cause of the problem area here is the lack of interest in technology on the part of children and school pupils. An object of debate in respect of this circumstance is whether children and young people receive too little encouragement to pursue an interest in scientific and technological matters and are thus unaware of the attractiveness and diversity offered by these fields of activity. Further possible causes are a lack of technical affinity and knowledge of company realities on the part of teachers. A further factor is often the absence of cooperation between the schools (or often even nursery schools) with trade and industry. This often leads to insufficient knowledge of the world of work and results in a poor image for the occupational field (bad marketing of occupations, a perception that working conditions are not good and that levels of wages are low).

Further correlatives within this problem area are connected with vocational guidance. Teachers often view themselves as not being responsible for providing their pupils with vocational guidance and the interests pursued within parent/careers advice favour academic occupations.

Problem field	Possible causes	Relevance in country <sup>5</sup>					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Lack of students choosing a technical training course</b>			1	1	3	2	1
	Teachers lack affinity for technology	1	1	1	3	1	2
	Teachers lack knowledge of company realities	1	1	2	1	1	1
	Lack of liaison between schools and industry	1	1	1	3	2	1
	Teachers don't feel responsible for career counseling	1	1	2	3	1	3
	Teachers perceive engineers as a graduate profession only	1	2	2	3	2	3
	Parents still value academic routes and advise accordingly	1	1	1	3	2	1
	Career advice often reinforces academic routes	1	1	1	3	2	2
	Poor marketing of the profession	1	2	1	3	2	3
	Image of the profession	1	1	1	3	2	1
	Lack of professional image	1	1	2	2	2	2
	Perceived poor working conditions	1	1	2	3	1	2
	Perceived poor salary levels	1	2	1	3	3	2
Demographic development	2	1	3	3	1	3	

## 2) Lack of technical training opportunities

Despite the economic growth which has taken place, recent years have seen a fall in training figures technical occupations in countries such as Germany, Austria, the United Kingdom and Slovenia<sup>6</sup>. Some experts view this decline in training numbers as one of the crucial causes of the shortage of skilled workers. Further causes are the high costs of technical equipment and plants for schools and the frequent absence of educational needs planning.

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Lack of technical training opportunities</b>			2	2	2	1	3
	decrease of apprenticeship positions in companies	1	2	2	3	1	3
	high (infrastructural and personal) costs of technical full-time schools	2	2	3	3	1	2
	difficult and not elaborated educational demand planning	2	2	1	3	1	3

<sup>5</sup> 1 = Very relevant; 2 = Partially relevant/ medium relevance; 3 = Not relevant

<sup>6</sup> The overall European report on the project provides a detailed description of the decrease in training numbers.

### 3) Trainee recruitment problems

This problem area may be linked with a series of possible causes. These include such factors as the decrease in training figures, although clarification is required of whether companies are generally taking on fewer trainees or whether the inadequacies of the position applicants find themselves in is the cause of the recruitment problems. Further co-relatives within this problem area are connected with the issue of image, firstly in relation to skilled worker occupations (negative press) and secondly in respect of the image of individual companies. It is likely that company specific characteristics such as salary, working time and working conditions play a part here. A lack of knowledge of possible training occupations and the world of work within the sector also need to be accorded consideration as possible causes. Furthermore, findings from the German case studies indicate that skilled workers possess only an extremely limited degree in respect of flexibility of location, a fact which may exacerbate recruitment of trainees for companies in regions which offer a lower level of attractiveness and a small number of schools. Neither is the aspect of applicant quality the least of the relevant factors within this context. Some companies still have very high expectations, these having had their origins in times when an over-supply of skilled workers was available.

Company location (attractiveness/image of the region) plays a major role in the recruitment of trainees for smaller companies in particular. This applies especially in regions where structural weaknesses are in evidence. Locations near to metropolitan areas and major companies/producers of branded goods are also problematic (wage structure, attractiveness of the company).

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Recruitment problems of trainees/ apprentices</b>			1	2	2	2	2
	Decrease of trainee figures	1	1	2	3	1	2
	Image of the occupation	1	1	1	2	2	1
	Image and working conditions of the company (wages, working times and conditions)	1	1	2	3	1	2
	Insufficient knowledge of occupations and world of work	1	1	2	3	1	2
	Lack of spatial mobility of skilled workers	2	1	1	3	2	3
	Attractiveness of the region	2	1	3	3	2	3
	Quality of the applicants	2	1	1	3	2	2
	Salary and conditions	2	2	2	3	2	2
	Competition with large enterprises/ brand enterprises	2	1	3	3	1	2
	Applicants lack basic ability to build upon	1	1	1	3	2	1
	Requirement of company- or (practical) work-specific Know-How	1	1	1	2	2	1
	High requirements for applicants by	1	2	2	2	3	3

	enterprises (dating from the time of a surplus of applicants)						
	Negative press	1	3	2	3	3	2

#### 4) Decrease in training figures

Conceivable causes from a socio-political point of view in this area are an increase in the number of those pursuing an academic pathway as a possible result of political demands. Another object of debate is a development of pupil interests towards an academic choice of career and the further encouragement of this by careers guidance services. A further possible factor is the image of technical occupations (negative portrayal on the part of parents and teachers).

Demographic development and the structural change to a service society in Europe are also a possible cause of the decrease in training numbers.

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Decrease of trainee figures</b>			1	1	1	1	1
	Number of academics are on the rise (political requirement)	1	1	1	3	1	3
	Pupils are more often interested in academic professions	1	1	1	2	2	2
	Linked to careers advice	1	2	1	2	2	2
	Negative image from both parents and teachers	1	1	1	3	2	2
	Demographic development	2	1	3	2	1	3
	Economic structural change ('service society')	2	1	3	2	1	3

#### 5) Recruitment of specialist/skilled workers

The findings of the sectoral analysis and the case studies demonstrate that companies are experiencing problems in the recruitment of skilled workers. The indicators for this are a longer time for job occupations and an increase in vacancies. In Austria, for example, the number of vacancies in metal and electrical occupations has been continuously increasing since 2002. After having reached a trough in 2003, the Netherlands have seen a strong increase in vacancies. In 2006, just under a fifth of all vacancies proved difficult to fill in Germany, the metal, electrical and vehicles industries being particularly affected.

A variety of possible causes are up for debate in respect of this problem area.

- Regional location of the company (lack of mobility on the part of applicants, location near to a frontier)
- Company image (salary, working times and working conditions)

- Occupational image
- Competition with major companies/producers of branded goods
- Lack of skilled workers on the market with the required specific job profile
- Applicant quality (rarely able to demonstrate a stringently pursued career)
- High application requirements on the part of the companies (a leftover from times when a surplus of applicants was available)
- Demographic change

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Recruitment of skilled workers</b>			1	1	1	1	1
	Regional situation of the company (insufficient mobility of the applicants, border situation)	3	1	1	2	2	3
	Image and working conditions of the company (wages, working times and conditions)	2	1	1	1	2	2
	Competition with large enterprises, brand enterprises	2	2	2	2	2	
	Shortage of skilled workers with special and desired occupational profile on the labour market	1	1	1	2	1	2
	Quality of applicants (stringent occupational careers are rare)	2	1	1	3	2	3
	High requirements for applicants by enterprises (dating from the time of a surplus of applicants)	1	1	2	1	2	?
	Requirement of company- or (practical) work-specific Know-How	1	1	1	1	1	1
	Recruitment of personnel with a 5/6 years of work experience	2	1	3	2	1	1

## 6) Securing the supply of specialist workers within a company

The fact that some skilled workers endeavour to pursue continuing training or an academic study (e.g. training as a certified technician or a degree course) once they have completed their in-company training and been offered permanent employment also creates problems for firms. Through this it is difficult for companies to secure a constant or even growing supply of skilled workers in quantitative and qualitative terms. A further observable trend is that skilled workers have already been recruited away by more financially powerful companies deploying the services of head-hunters.

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Problems in safeguarding the pool of skilled workers in a company</b>			1	2	2	2	2
	Young (efficient) skilled workers are inclined to undergo further training and study courses in higher education	1	1	2	2	2	3
	Headhunting	2	1	3	3	2	3

### 7) Skills deficits at a specialist level

A further significant problem area within the context of the skilled worker situation of companies in the manufacturing sector is the skills status at specialist worker level. Possible causes range from a lack of systematic identification of needs and requirements planning within the companies (particularly in the case of SME's) to inadequate documentation of the skills status of specialist workers and extend to include the absence of matching job advertisements against requirements profiles. In addition to this, readiness to learn at specialist worker level often remains insufficient nowadays, and small companies in particular lack an overarching corporate learning culture. Further causes for skills deficits at specialist worker level include the change of work brought about by new forms of work organisation, new cooperation and communication structures and new technical requirements.

Deficient knowledge management caused by the loss of know-how of older employees leaving the company can lead to further skills deficits. Securing long-term employee loyalty is also becoming increasingly important for smaller companies.

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Qualification deficits on the level of skilled workers</b>			2	2	2	2	2
	No systematic assessment or planning of demand (SME)	1	1	1	2	2	2
	No documentation of the qualification status of the skilled workers.	3	1	2	1	2	2
	Little comparison between job description and requirement profile.	2	2	3	2	2	
	Insufficient willingness to learn of the skilled workers.	2	2	1	2	2	2
	Lack of learning culture in the companies.	2	1	2	1	2	2

	Change of work organization → group work also requires increased social and methodological competencies,	1	1	2	1	2	2
	Seniors communicate too little with the skilled workers.	2	1	1	1	2	3
	Knowledge deficits caused by a loss of know-how of elder employees when they leave the company.	1	1	1	1	2	2
	Demographics; the majority of workers who will be needed up to 2030 are already within existing workforce	1	2	3	2	2	3
	Specific requirements (technical, social) of the companies	2	2	2	2	2	2

### 8) Training deficits in schools (curriculum, conditions)

A further problem area concerns training deficits in schools. The debate needs to focus on the low level of current validity and the lack of quality of the curriculum and the deployment of obsolete teaching methods. Skills acquired at school are out-of-date and no longer meet the current requirements of industry. The causes here include the use of old technologies, no money being available for new equipment.

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Educational deficits in school (curriculum, conditions)</b>			2	2	2	2	2
	Inappropriate curriculum content	2	2	2	2	2	2
	Inadequate teaching and learning styles	2	2	2	3	2	2
	Lack of capital expenditure (new equipment expensive)	2	2	2	1	2	3
	Schools and Colleges are unresponsive to needs of employers	1	2	2	3	2	2
	Imparted Knowledge/Qualifications are out of date and do not meet the needs of industry	2	2	3	1/2	2	3
	General low quality of curriculum contents	2	2	3	2	3	1

### 9) Attitude of companies towards initial and continuing training

The attitude of companies towards initial and continuing training may lead to a shortage of skilled workers in the sector if firms are not prepared to invest in initial and continuing training for their employees. The status of initial and continuing training within company's culture plays a major role here.

Problem field	Possible causes	Relevance in country					
		UK	Germany	Slovenia	Italy	Austria	The Netherlands
<b>Problematic company attitudes towards training</b>			2	2	2	2	2
	Cost of training	1	2	2	2	2	3
	Companies can't afford to provide time for training	1	2	2	2	2	2
	Low consideration of training (cultural aspect)	1	2	3	1/2	3	3

### **3. Company strategies practised within the manufacturing sector in Europe**

All strategies and measures identified within the scope of the empirical investigations undertaken in the six European countries have been developed and implemented in a company specific manner on the basis of the prevailing respective internal and external general conditions. These strategies are frequently embedded in a bundle of company measures. Attention needs to be drawn to the fact that a clear correlation between the problem situations and the strategies practised does not always exist. For this reason, the company strategies described below are intended as proposals companies may choose to act on.

#### **3.1 Staff recruitment**

The procurement of new skilled workers is indispensable for companies with a specific requirement for specialist staff and is accorded a high degree of priority. Companies tend to view the classic form of external staff recruitment as problematic in respect of obtaining a sufficient supply of qualified specialist staff at skilled worker level. Criticism is levelled at the inadequate numbers of skilled workers on the market, and fault is also found with the lack of mobility within this target group, including in terms of motivating workers to move to other regions. The view of one Head of Production is that it is “extremely difficult to obtain skilled workers from the market who then fit in with the structures of the company”. Individual companies in such countries as Germany and Italy have all but given up on recruitment via the classic job advertisement or are restricting the placement of such advertisements to the regional labour market. Successful recruitment today requires long-term planning. Some of the approaches adopted in this area, such as partnerships, tapping into specific labour market reserves and a variety of regionally specific strategies, are described below.

##### (In-firm) training / apprenticeship training

For those countries which operate a dual system of training, in-company training provides a strategic field of activity for the purposes of avoiding a shortage of skilled workers, whereas other countries have the opportunity of establishing a greater degree of cooperation between companies and the vocational schools. The case studies have made it plain that a good practice approach involves investing a considerable degree of commitment into training in order to develop the up-and-coming workers who are required within the company itself. The fact that future skilled workers are able to complete social and specialist adaptation to the specific conditions whilst they are still undergoing training is viewed as constituting a particular benefit of this approach.

Companies are increasingly availing themselves of the opportunity to exert an influence on the way training is structured, the aim here being to achieve training which is tailored to the greatest possible extent to the later qualification requirements of the skilled work to be performed. The case studies have made it clear that SME's view the earliest possible integration of trainees into the real production process as an important aspect. This is the only way in which trainees are able to acquire the knowledge of the work process which they will require to carry out their daily work later. The view of skilled workers today is that the increasing degree of specialisation in many company production sectors, factors such as increased precision and qualification requirements and the highly complex nature of many plants mean that the conventional form of training no longer provides adequate preparation for the execution of specialist work in specialised production divisions at a later date. For this reason, endeavours are also being undertaken to introduce helpful measures by deciding at the earliest possible stage in which production division a trainee will later be deployed in order to enable practical knowledge of this area to be acquired in a targeted way during training, including involvement in real working processes (AT2, p. 31; DE2, p. 38; SI2, p. 72). For this purpose, trainees rotate within the company in order to familiarise themselves with various areas of operations and processes (SI2, p. 71; UK1, p. 79).

Even before trainees were taken on, companies put their faith in recruiting tests to discern individual problems and weaknesses in advance. These problems and weaknesses can then be addressed and alleviated at a later stage within the training programmes, providing companies with such options as taking on trainees who would have been previously excluded because of a lack of knowledge and skills for a period of one year (AT1, p. 29; NL1, p. 57).

#### Sponsorships (nursery school/school)/partnerships

The general conditions which apply in terms of making optimum use of the tool of in-company training kick in some time before training actually commences. For this reason, companies are undertaking a wide range of endeavours to establish a positive employer image, obtain early loyalty to the company as a potential provider of training on the part of school pupils and even children of nursery school age and engender an enthusiasm for technology in these pupils and children. The reasons for adopting such an approach include the poor image of some occupations ("dirty jobs") in the metalworking sector. A selection of measures which have been deployed on the part of companies for these purposes is listed below (AT1 and 2, p. 28, 31; DE1, p. 34 f.; DE2, p. 39, 40; IT1 and 2, p. 48, 52; NL1-3, p. 57 f., 60 f., 64; SI1, p. 67).

- Cooperation with nursery schools to fire children's enthusiasm for technology
- Providing special courses in schools (such as job application training)
- Establishing and maintaining regular contact with parents of the school pupils

- Training for school teaching staff (technological know-how) and vice-versa (theoretical knowledge for companies)
- Participation in so-called job competitions (pupils test their vocationally related talents by sampling real life work)
- Providing in-company work experience placements or holding open days
- Providing electro-technically based courses for schools
- Offering a prize for the best electro-technical innovation developed by students
- Holding in-company project weeks for school pupils
- Taking part in training fairs
- Encouraging girls and women to take up technical occupations (e.g. girls' day)

In-company project weeks addressing a practical problem provide school pupils with a framework in which they can learn to express themselves, work autonomously to classify information, find creative solutions to problems which arise and document and present their work (AT1, p. 28; DE1, p. 35). A further aim is thus to familiarise school pupils with training content and present the company.

#### Tapping into specific labour market reserves

The explicit recruitment of older skilled workers can be stated as an example of good practice (IT2, p. 51; NL3, p. 64). A rethink is already discernable here. Whereas up until a few years ago only young skilled workers were taken on, the increasing problems in filling vacancies mean that older specialist staff with extensive experience is now also employed.

The following factors favour the recruitment of older employees.

- High availability (availability on the labour market)
- Immediate availability
- Shorter induction periods than is the case with younger skilled workers
- High level of specialist qualification
- High degree of stamina and assertiveness
- High level of motivation and loyalty
- More relaxed and a greater ability to distance themselves in stress situations than is the case with younger employees
- High degree of social and communicative competence (in such areas as dealing with customers and suppliers)
- A wealth of life experience

- Deployment in mixed-age teams -> increase in efficiency compared to homogeneous age teams
- Stability – no further interest in changing companies

Despite all the debates centring on equality of opportunity, women are often disadvantaged when it comes to obtaining jobs. This becomes clear in particular in small manufacturing companies in which the taking on of women in the producing sector is seen as especially problematic. Since female employment potential remains far less exploited than is the case with men, initiatives specifically addressing these workers are worthwhile. The fact that women frequently need to combine their career with their family, flexible working time and payment models are of relevance, and these are still too little used to little in small companies (NL1, p. 58).

### Regionally specific strategies

Alongside the established recruitment strategies, an increasing number of regionally specific strategies are available to companies at a regional level (DE2, p. 38).

- Participation in regional job fairs represents an instrument for the targeted recruitment of skilled workers from the region.
- Searching via the Internet or using the corporate webpage for recruitment purposes are increasingly gaining in significance over placing job advertisements in regional periodicals.

In Slovenia, some attempts are being undertaken to recruit skilled workers via the radio<sup>7</sup>. Using temping agencies to recruit employees is undergoing an enormous increase across the whole of Europe, depending on the amount of demand for specialist workers (DE3, p. 44; NL1, p. 56). Within this context, some skilled workers are being employed on a probationary basis (three months) in order to enable assessments of personal skills, qualifications levels and personal progress to take place.

The realisation that even a good employer image is frequently insufficient to enable successful recruitment to take place in a region which is considered unattractive is leading to increasing commitment on the part of small and medium-sized enterprises in particular to regional measures for the purposes of

- increasing the attractiveness of the region and
- preventing skilled workers from migrating away.

The aim of such activities is to improve the regional location, and they often feature the joint involvement of various stakeholders such as companies, institutions and policymakers (DE2, p. 37 f.). Some of these co-operations extend beyond national borders. In the Netherlands, partly companies are working with German employment

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<sup>7</sup> Found in another Slovenian case study, that is not printed at the end of the report.

agencies, sometimes leading to more fruitful experiences than when cooperating with their own agencies (NL2, p. 59).

Regional image plays a major role for small and medium-sized companies, and various initiatives are launched to increase the awareness level of such firms. These many take place within the context of establishing contact with parents, participating in training fairs and staging events at local schools to encourage more school pupils to apply for a training place in a technical occupation (cf. partnerships).

### **3.2 Training**

A specific analysis of training needs is a prerequisite for the facilitation of requirements oriented training. This applies both to employees within the company and to the exploitation of specific labour market reserves (long-term unemployed, women, older people). This is the only way in which newly recruited workers can be prepared for company processes and specific requirements. The prevailing shortage of skilled workers in some regions has meant that training a company's own employees is playing an increasingly major role. Within this context, some companies are also attempting to train the target group of unskilled and semi-skilled workers to carry out individual tasks at skilled worker level.

#### Further training of employees (skilled workers)

The continuing training/human resources development field of activity harbours significant potential in terms of how companies deal with the shortage of skilled workers at specialist level. A wide variety of opportunities is available here in order to

- a) train externally recruited employees for the specific requirements of company production areas (AT1 and 2, p. 28, 30; DE1 and 3, p. 35, 45; IT2, p. 51; NL1 and 2, p. 56, 60; SI1, p. 68; UK3, p. 85),
- b) maintain internal company employees at the required standard in accordance with company requirements and train them in line with future developments (SI2, p. 72; SI3, p. 75).

Approaches towards providing continuing training for employees in the face of changes to working tasks or the introduction of new technologies are ongoing in many companies. Usually larger enterprises are establishing company specific academies with the aim of putting measures in place for all staff from within the company itself. These academies often offer employees a wide range of provision, affording them opportunities to develop their specialist and personal competences or to gain higher qualifications within specific programmes (higher education courses of study/dual courses of study) (AT1 and 2, p. 29, 31; DE2, p. 38; NL1, p. 57; SI1, p. 67 f.; SI2, p. 71; SI3, p. 75; UK1 and 3, p. 79, 84). Smaller companies are having to use their own employees as a vehicle to transfer this knowledge or invest in external persons/programmes to act as training providers. One company from Italy, for

example, is using a two stage procedure for the introduction of new processes/technologies (IT 3, p. 53):

1. explorative phase: familiarisation with the production procedure;
2. training phase: initial or advanced training in working with the machine in question provided by the company's own staff or by external experts.

Despite the introduction of company specific academies (AT1 and 2, p. 29, 31; NL1, p. 57) or the fact that external trainers are being accessed, "learning on the job" still remains the most widespread form of learning within the companies (AT1 and 2, p. 29, 32). Companies are also making increased use of new forms of learning such as e-Learning (IT2, p. 51).

### Training of unskilled and semi-skilled workers

In Europe, the fact that a strong decrease in the number of simple work tasks and activities is taking place means that the group of unskilled and semi-skilled workers is most at risk from unemployment. Providing specific training for unskilled and semi-skilled workers in respect of individual tasks at specialist worker level or training leading to a recognised vocational qualification enables the specialist skills gaps within companies to be addressed. In one of the good-practice companies investigated in Germany, unskilled and semi-skilled workers were "trained up", although this process did not lead to the acquisition of a formally equivalent qualification. If an employee demonstrates an appropriate level of potential, the continuing training profiles which have been developed for this target group are implemented, and continuing training takes place via work oriented learning projects. Such continuing training profiles are accorded such designations as "quality specialist worker" or "production specialist" (DE1, p. 36; SI1, p. 68; SI2, p. 72; SI3, p. 76 f.). In some European countries such as Germany and Austria, a range of support programmes is also in place to assist this target group in the continuing training process.

### **3.3 Employee loyalty**

SME's still often do not view employee loyalty as an explicit area of activity, and the rate of staff turnover in such companies is frequently not very high. Notwithstanding this, companies are increasingly seeking to establish staff loyalty via various measures. Such an approach is becoming increasingly important in regions where the requirement for skilled workers is extremely high in order to be able to retain specialist workers in the face of competition from major companies.

It may be stated that the following areas of influence exert an effect on the success of measures aimed at establishing employee loyalty.

- Image of the company and corporate culture

- Health management
- Personnel development (career pathways)
- Knowledge management

### Image and culture

The objective of image work conducted by good-practice companies is the long-term retention of employees. This is an area where smaller companies often have a considerable amount of ground to make up. A range of evaluation approaches is used to gain an impression of just how satisfied employees are within their companies and to which topics they attach a particular degree of importance. These include employee appraisal and target setting interviews (AT1, p. 28; DE1-3, p. 35, 38, 45; NL1, p. 58, SI3, p. 75) or investment in initial and continuing training (SI1, p. 68; SI2, p. 72). For these purposes, periodically recurring employee surveys (mostly on an annual basis) are conducted and evaluated. A particularly crucial part of this process is monitoring the targets which have been set and robustly addressing the fields of activity which have been identified. The elimination of existing incongruities and the expansion of factors perceived as positive provide a vehicle for the establishment of a high degree of identification with the company.

### Health management

The health of employees and their ability to deliver a constant level of performance are becoming crucial competitive factors for companies. There is still a prevailing prejudice that older employees are less well performing, less capable of learning, less able to deal with stress and more susceptible to illness than younger workers. A precise observation of the situation, however, permits the conclusion that the drop off in performance levels in the case of older workers is not necessarily caused by their age. Long lasting and monotonous work stresses can often be identified as the causes for the steeply declining performance levels and the significantly higher incidence of illness amongst this group. Lower levels of performance and the higher degree of downtime caused by illness are thus often a result of working conditions rather than being attributable to biological age. Demographic change is already discernable and has resulted in the increased work on the development and introduction of health management concepts which is currently ongoing (NL1, p. 56). A high degree of pressure to take action is being articulated in this area, "since we cannot assume that a specialist worker will be in a position to remain in the workplace until an advanced age (such as 67) given the strong prevailing pressure to perform" (DE1, p. 36). The hope is that a health management system can act as a vehicle for bringing about the changes in conditions required for skilled workers to remain in the workplace for a longer period of time.

## Personnel development

Many small and medium-sized companies do not have a professional staff development system in place. Although the necessity of having such a system is being increasingly recognised, it is often the case that extremely limited resources or even no resources are available for the purpose. Within the good-practice approaches, it was possible to identify a number of instruments being deployed for successful personnel development:

- Employee appraisal and target setting interviews (AT1, p. 28; DE1 and 3, p. 35, 45; NL1, p. 58; SI3, p. 75),
- Deployment and use of a skills/competence matrix<sup>8</sup> (e.g. Computer aided administration of skilled worker competences and continuing training measures for such workers like SAP) (AT2, p. 31; DE1, p. 35),
- Implementation of career programmes (IT1, p. 48),
- Inducting new employees within a mentor system (NL2, p. 61; SI2, p. 72; SI3, p. 75; UK2, p. 81)
- Close contact and communication with skilled workers from their line managers in order to enable acute skills deficits to be identified in as timely a way as possible and permit appropriate measures to be derived (DE1-3, p. 35, 41, 45; IT3, p. 54; NL1, p. 56; UK1 and 3, p. 79, 84),
- Development of in-house seminar provision implemented by experts from within the company (enabling rapid access when required and permitting provision to be tailored to company specific skills needs) (AT1 and 2, p. 29, 31; SI1, p. 67; SI3, p. 76; UK2 and 3, p. 79, 85),
- According consideration to the methodological and social competence development of skilled workers alongside their specialist skills adaptation (AT1, p. 28, DE1, p. 38; IT1, p. 48; UK3, p. 84).

An increasing number of companies are attempting to adopt a range of approaches, including using a skills matrix (AT2, p. 31; DE1, p. 35), to record competences, and therefore knowledge, and conduct a systematic evaluation. The main priority here is to develop these competences further and/or map requirements and competence status on an annual basis, reacting via appropriate training measures. The way of recording indications of needs (interview or questionnaire) has already been structured in some cases, although this only takes place on an on-demand basis. Some companies are developing their own staff evaluation forms for this purpose (DE3, p. 45; UK3, p. 85), which enable specialist or personal development compared to the previous year or in terms of the whole of a worker's period of service within the company to be read off and assessed.

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<sup>8</sup> The matrix is used for identification of skills and competences and suggests special measures.

In the field of staff development, an increasing degree of importance is also being accorded to the accreditation of previously acquired knowledge or of competences which have been gained informally in order to allow consideration of the respective opportunities for further training to take place. In the Netherlands, accreditation procedures are already established, as one good-practice example shows (NL2, p. 61).

### Knowledge management

The necessity of knowledge transfer is being emphasised at all levels in a number of companies. This is particularly also taking place within training in order to transfer knowledge from experienced skilled workers to trainees (UK2 and 3, p. 82, 85).

Initial experiences with the “migration” or loss of expert knowledge, which occurs when experienced older workers leave the company, have strengthened the recognition of the necessity of retaining such knowledge within the company by documenting it (DE2, p. 37). Notwithstanding this, it has not yet proved possible to identify any specific good-practice examples of a successful knowledge management system at the level of implementation. Initial ideas are being developed in some cases. Detailing the specific knowledge or “ruses and tricks” experienced skilled workers have in terms of dealing with plants and production processes and making such information accessible to younger specialist workers within the company in the form of problem-based documentation, for example, is viewed as crucial. Communication and cooperation between older and younger workers play a decisive role in knowledge transfer. This transfer often takes place directly within the workplace (AT2, p. 32).

Especially in the manufacture of high-tech products, errors in the production process can cause considerable losses. For this reason, more and more companies are attempting to effect an immediate transfer of experiences gleaned from the manufacture of new products and the deployment of new procedures and integrate this into a company knowledge management system (UK3, p. 85).

### **3.4 Inter-company measures**

Inter-company measures aimed at the reduction of the shortage of skilled workers are particularly prevalent in areas where companies are having difficulties in providing training themselves or where companies located in regions where structures are weak are at a disadvantage compared to other companies (often major companies). In these areas, networks or associations have been established to counter this disadvantage via mutual cooperation. Two examples are presented in more detail below.

### Regional branch networks

In regions where structures are weak, smaller companies in particular often have experience problems in finding appropriate skilled workers. In one structurally weak region investigated in Germany, the regional branch network views itself as an innovation network whose purpose it is to strengthen the economic location and commits itself to promoting the regional image. The network is a consortium of companies from the engineering sector. Its aim is cooperation, including a regular exchange of information, experiences and knowledge, with the objective of strengthening the economic and technological performance of the SME engineering branch in the region. Creative solutions and practical experiences for current issues are exchanged. This involved the staging of a regular forum by eight regional companies to present their successful concepts for employee retention and loyalty as activities they had undertaken to counter the shortage of skilled workers. The issues presented and debated included the effects of demographic change on the labour market, methods for determining and improving employer attractiveness, questions relating to the working atmosphere within a company, the integration of new workers into a firm, continuing training provision, programmes to support up-and-coming talent and improving the family friendliness of companies (DE2, S. 37 f.).

### Training networks/training funds

Particularly for small and medium-sized enterprises in Austria and Germany, training networks provide an important perspective for the carrying out of vocational education and training and for the securing of up-and-coming talent for the manufacturing sector. Vocational education and training is organised and provided via mutual use of training capacities. This affords companies which are unable to cover the costs of providing the full spectrum of training on their own the opportunity to participate in VET. In addition to this, an increased degree of organisational assistance provides companies with the motivation to train their skilled workers themselves or within training networks.

Training within training networks offers the following advantages.

- Some degree of outsourcing of training to other companies and educational establishments
- Cross-company training activities
- Exchange of apprentices
- Exchange of competence, material, trainees
- Co-operation in joint projects

Training within training networks enables small and the smallest companies in particular to participate in training. Companies also receive financial and organisational support in the form of advisory services. This enables company gaps

to be closed in parts of training which a trainee's own company is unable to deliver. This also often permits trainees to broaden their horizons. Training networks receive public support in both Austria and Germany.

In Vorarlberg in Austria, a training premium fund model enabled a good degree of success to be achieved in motivating companies in the electrical and metalworking sector to take part in training. Deployed in combination with precisely defined quality requirements, the model has been shown to have led to the recruitment of more trainees and to the creation of high-quality training places. The system involves the payment of a certain percentage (currently 2.4%) of gross wages and salary into the training premium fund. Company participation is voluntary. Any company taking on trainees receives a one-off payment of € 4,360 per trainee from this fund. The money is also used to finance occupationally related activities such as funding celebrations to mark apprenticeship completion and supporting training for trainers.

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## **Good Practice Examples Austria**

### **Company 1**

#### **Framework Data of the Company**

With its 300 employees, the manufacturing company described here is the largest subsidiary of a group active in metal processing and hardening, comprising a total of ten production sites in Austria, Switzerland and Germany. The overall group is organised as a stock company.

The company's philosophy and key message "Knowing what the customer needs" is lived across all of its sites.

The production site analysed here processes, hardens and tempers 700 tonnes of metal parts, which in this way obtain the properties required by customers. The product portfolio to be processed ranges from small parts in mobile telephones and refrigerators to common-tail diesel engines.

To counteract any shortages of qualified labour in the skilled workers' segment, the company puts emphasis on providing well-founded in-house apprenticeship training, which has proved its worth for many years; therefore the majority of skilled labour as well as many executives of the company have completed such internal programmes.

The studied site employs a staff of 300, of which some 80 work in administration, the remainder in production, 31 of which are apprentices. The company is active in surface finishing and processes components for its customers – ranging from window frames to furniture fittings and car parts.

The entire group's staff level has risen from 750 to 900 over the past five years, and the staff level of the site under investigation has increased by some 100 people in the last three years.

The individual sites are subdivided in accordance with the technology they apply. These are: electroplating, hot-dip galvanising, and organic coating. The studied site focuses on electroplating.

Its business fields include:

- fittings (furniture, window, door, construction fittings and fastening elements),
- vehicle engineering (components for passenger restraint systems, e.g. safety/seat belt systems, passenger compartment, engine compartment, chassis, body parts),
- telecommunications (components and parts of casing for mobile telephones), electrical engineering (plug housing, plug contacts),

- building construction (sections for façade construction and interior equipment).

### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

Due to the “dried-out” labour market, it is, above all, rather difficult to recruit machinery and systems engineers, complex machinery electricians as well as skilled workers in chemical engineering. To counteract this trend, the studied site provides apprenticeship training in the following occupations: surface engineers, machinery and systems engineers, chemical laboratory technicians, industry office assistants.

### **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

#### **HR development**

Standard HR development instruments applied by the company include annual staff appraisals, in the course of which the employees’ development opportunities as well as the objectives attained in the past are discussed.

It is only with the best employees that the company is able to maintain or even expand its current market position. The company offers its staff a wide variety of benefits: a secure workplace; an in-house academy for CVET measures; wages and salaries in compliance with market conditions; as well as cross-site information exchange (different kinds, which result from an intensive cooperation of the production sites). The staff’s job security has top priority.

#### **Promotion of soft skills/project works during apprenticeship**

In its initial and continuing vocational education and training (IVET and CVET) measures, the company places particular emphasis on the development of soft skills. This already starts in apprenticeship training. One relevant example are the project works to be conducted every year: Within the framework of practice-oriented assignments, on the basis of a practical problem, apprentices learn to communicate, organise information for themselves independently, solve emerging problems creatively, and document and present their work.

#### **Cooperation ventures with schools**

The company mainly recruits apprentices from among graduates of lower secondary school and prevocational school. To make direct recruitment possible, the company invites school classes to make excursions to its premises. In addition, the person

responsible for training apprentices presents the contents of apprenticeships provided by the studied company in relevant schools. There also exists the opportunity to do a shadowing apprenticeship on site.

### **Promotion of disadvantaged youth**

The entrance tests every apprentice has to take are not excluding but including. This means that they aim to identify individual or partial weaknesses in advance, which will then be made up for by targeted training programmes. This measure enables the company to recruit one apprentice a year who, in normal circumstances, would not be considered for an apprenticeship due to lack of knowledge and skills.

### **CVET and CVET academy**

A company-specific “academy” has been set up with the aim of conducting CVET measures for the entire staff - a cross-site instrument for the staff’s skills training and acquisition of qualifications. The academy offers a wide variety of opportunities to the staff to develop their specialist and personal skills. It aims to (further) develop the employees’ skills and qualifications and to network the company’s sites.

Planning for the individual employees’ skills and training measures requires the direct superior’s approval following the annual staff appraisals. In addition, the examined site supports employees if they want to take part in external education and training measures.

### **Learning on the job**

Apart from organised forms of CVET, learning largely takes place directly at the workplace. Especially for apprentices, a room for apprentices with its own library has been installed.

## **Company 2**

### **Framework Data of the Company**

The described company from Lower Austria is active in cutting, mowing and sawing with a specialisation in mower knife systems and chaff knives. Founded in 1888, the company is considered a specialist in the sector. Today it has 185 employees in Austria, and three subsidiaries in North America and Hungary. The following description refers to the Austrian site.

The company is set up as a limited liability company, is located in the rural part of the province of Lower Austria, and counts among the largest employers in the region. It is active in the metal products supplier industry and a specialist for cutting and high-wear components and supplier of the international agricultural machinery industry.

In recent years, staff levels have remained relatively constant at some 185 employees, with three quarters active in production, one quarter in administration. Their apprentices are trained in technical occupations of production; one third of the company's workers is unskilled, the remainder skilled labour. Employees at master craftsman level work in administration.

The company produces cutting components for agricultural machinery and highly wear-resistant cutting components. This is a niche production, specialised in agricultural machinery, with chaff knives being the product generating most of the turnover. Production runs in two- and three-shift operations of eight hours each. Apart from products for the machinery industry, the company also manufactures its own production plants itself. Manufacturing is semiautomatic by using robots, with work done partly by teams and partly in conveyor-line production; there are also functionally structured workplaces where manufacturing processes that use the same technologies are combined. 93% of production is exported, mainly to Germany, followed by the US and Canada, the EU and other countries. The company supplies renowned companies in the sector, its customer and supplier relations have not changed significantly in recent years.

### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

Nearly all of the company's skilled labour has completed in-house training schemes. Today's master craftsman started as apprentices in the company and have since taken part in further training and other courses to develop their skills. If the company needs to recruit skilled labour, it selects from among existing applications and also takes advantage of the provision of Public Employment Service Austria (AMS) and its registered jobseekers. Word of mouth works best. The situation in the company is not

so much characterised by recruitment needs but by the fact that the people from the region apply for posts at this renowned enterprise – the major employer in the district. Whenever the company needs to search for skilled workers itself, it turns out that there is a lack of qualified skilled labour that is willing to work. Also other companies in the region where no training is provided, state that recruitment of qualified workers represents a major problem. Although the company is not affected by skilled labour shortage, it could recruit a saw setter and a CNC machine operator. Even though craft-related skills and qualifications can generally be found, recruitment problems will in general occur in relation to programming and automation techniques.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Apprenticeship training**

The company provides training in future-oriented metal-processing occupations such as: machine fitter; and in a double apprenticeship scheme: machine fitter and industrial maintenance electrician; as well as tool maker; machine turner and milling cutter; materials tester; and electronics technician. The company has always trained its own skilled labour in apprenticeships, with the number of apprentices increasing as demand grows, at a current level of 21. Apprentices learn their trade from scratch and are taught to handle all operating material. This provides a sound basis for the company's later skilled labour and master craftsperson.

### **Cooperation ventures with schools**

For apprenticeships, the company approaches schools and invites school classes to make excursions to its premises. Apprenticeship post seekers are offered to complete taster weeks and the option of working as interns, e.g. a training in holiday time.

### **Organised CVET (competence matrix)**

CVET is institutionalised at the company and is conducted in-house and externally pursuant to an annual training plan. It is within the sphere of master craftsperson to identify on the basis of a competence matrix which skills are available in the department, which are needed, and how training should be conducted. Last year alone, 85 people took part in enterprise CVET. These programmes are in general rated as very positive by participants. Examples of programmes include: programming of robots; CNC programming technique; quality assurance; executive training; and EDP / IT programmes in general.

Skilled workers who are trained by the company itself are well prepared for their tasks on site. Those who have the ambition to complete a foreperson course will be supported by the company. This course involves intensive project work.

**Learning on the job and safeguarding of expert knowledge (learning from older workers)**

Learning also takes place directly at the workplace – either involving colleagues or in the form of courses. The older workers' expert knowledge is passed on to successors within the framework of on-the-job training.

## **Good Practice Examples Germany**

### **Company 1**

#### **Framework data of the company**

The company is working in the field of production of components for electronic appliances (predominantly white goods). The surveyed location in Baden-Wuerttemberg is at the same time the headquarters with currently 1,100 persons employed there. Worldwide the company operates more than 20 locations with a total of 7,300 employees. A number of different branches of production can be identified at the surveyed location (e.g. production of electronic appliances, assembly of thermostats etc.).

The company is a family enterprise managed by the owner and has been an actor on the white goods market since 1925. For a long time, the core business of the company was the production of hotplates. Today, the company is above all a supplier of electrical components for manufacturers of household appliances. The company is partly the world market leader (with market shares from 60 to 80 per cent) in this market segment. Apart from the still highly ranked production of hotplates the company has developed into a high-tech enterprise in the last decade. The business activities range from the foundry to the production of dust-free clean rooms. Worldwide the company had a turnover of 588 million Euro in 2006. The share of the headquarters is 330 million Euros.

#### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

The company employs skilled workers with a graduation as industrial mechanics, toolmakers, mechatronics, and electronic technicians for the individual production lines. There is no acute shortage of skilled workers so far. This is remarkable given the fact that a lot of production lines are currently expanding and reporting a need for additional skilled personnel. The not (yet) acute shortage of skilled workers can be explained in various ways: On the one hand skilled workers with adequate training could be taken over from neighbouring companies that were forced to close their production. On the other hand the company has developed and implemented a comprehensive personnel marketing concept and a loyalty concept aiming at sustainability and designed to support a very early company loyalty of the apprentices-to-be as well as a positive employer image. For the future the company expects increasing difficulties with the (internal and external) recruitment of personnel

for all required specialisations (industrial mechanics, toolmakers, mechatronics, and electronic technicians).

Currently there is a problem with the external recruitment of new employees of the above mentioned specialisation on the shop-floor level. This is above all a new phenomenon in the new die cutting centre. According to the director of production of the department it is “extremely difficult to find qualified skilled workers on the labour market who also fit into the structure of the company”. There is a concrete need predominantly for toolmakers that can master the cutting-bending technology and ideally are experienced in the operation of a BIHLER automatic machine tool. This calls for a rather specific qualifical profile. Recruitment attempts through advertisements in local newspapers did not yield the desired pool of applicants.

In the field of vocational education and training the company has a certain problem that one share (at least 3 to 4 of 34 each year) of the apprentices of an age group who have successfully finalized their apprenticeship enter further qualification measures (e.g. training courses for technicians, master craftsmen or postgraduate studies). This leads to an insufficient supply with “sound skilled personnel” ready to work in the production for a longer period of time. The reason for this development is seen in the increased requirement levels for vocational training. Apprentices who are able to successfully graduate from their training courses are usually so excellent that they are eager to undergo further qualification. Apprentices with less favourable prerequisites, however, are often not able to finalize their training courses. This development is deemed very critical as it leads to a bottleneck of skilled workers in the production: Trained skilled workers leave the company after a very short period of time (1 to 2 years) in order to undergo further qualification.

With regard to an increasing shortage of skilled workers the company attaches high priority to the documentation of knowledge. It is above all a problem to access and save the knowledge of long-time employees who are often not able to explain their comprehensive experience knowledge. This problem is visible in skilled workers in the field of die cutting who have acquired a specific know-how in the operation of very old plants and machines (e.g. also to increase the lot sizes). The loss of this valuable knowledge is often only felt as soon as a skilled worker has left the company.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Early loyalty/commitment of future skilled workers/ incite an interest in technology**

The company intensively pursues a number of local school co-operations (Secondary Grammar School, Technical Secondary Grammar School, Secondary Modern

School) with the aim to establish a loyalty of prospective apprentices to the company. The implementation and the shaping of these co-operations are manifold. The most important activities are mentioned below:

- Award of an own prize. Pupils of the local Technical Grammar School are encouraged to develop technical innovations (e.g. construction of an electronic door opener for a dishwasher).
- Offer of courses on different electronical themes (e.g. electrical pneumatics) for pupils.
- Organisation of a job application training in all schools of the surroundings.
- Cooperation within the framework of GFS (*Gleichwertige Feststellung von Schülerleistungen an Stelle einer Klassenarbeit* = Equivalent assessment of student performance in lieu of tests) at the local Technical Secondary Grammar School.
- Internships for pupils in the training workshop.
- Project weeks for pupils (e.g. assembly of an electronical ant).
- Cooperation within the framework of further teacher training in order to increase the teachers' technical know-how; systematic regular information of the teachers on opportunities to cooperate with the company within the framework of school education.

### **Further development of employees**

With regard to the employees the company adheres to the maxim to bind them possibly to the company and to qualify accordingly of the changing requirements. The Chairman of the work council thinks that this culture is favoured by the type of company – a limited company operated by the owner.

The company runs a comprehensive further training programme with around 150 different training courses for employees of all hierarchy levels. This includes courses across all specialisations (e.g. leadership) as well as technical training courses (e.g. on changes in the die cutting centre). Training courses offered by the manufacturers of the machines take place to familiarize skilled workers with special machine knowledge. Within the framework of yearly appraisal interviews and with the aid of a qualification matrix, the competencies of the skilled workers are systematically assessed by their seniors and further developed according to individual deficits and work oriented needs. Apart from the compulsory annual balance of requirements and the status of the competencies of the skilled workers it should in the meantime also be possible to remedy short-term deficits by target oriented further training measures. The needs are reported to the training department and adequate prompt measures are initiated. The administration of this professionalized further training system is managed with the aid of SAP.

## **Investment in education and training**

34 apprentices – i.e. 10 more than in the year before – were accepted for the current training year. The number of training positions was increased for the occupations of industrial mechanics, toolmakers, and electronic technicians. This high level will also be maintained for the training year to come. This development is due to the expansion of the location: The technical business fields (as well as the field of cutting technology) report a higher need for skilled work. The quantitative increase of training is thus due to a forecast of a higher need. At least 99 per cent of the graduates are employed by the company.

## **Qualification of semi-skilled and unskilled workers**

Apart from the internal recruitment of own apprentices in the production lines the company is also trying to systematically „upgrade“ semi-skilled or unskilled workers to the level of skilled workers (albeit without a formally equivalent graduation). This option is realized as soon as a clear potential is identified in such an employee. Further training profiles are being developed for this target group by the company (so-called quality skilled personnel or production skilled personnel) and the further training course is shaped with work oriented learning projects.

## **Health management**

The already clearly perceptible demographic change has led the company to currently work on the development and the implementation of a health management concept. It is crucial to take immediate action as it is expected that skilled workers will not be able to hold their workplaces up to the age of 67 as they are confronted with a high pressure to perform. There is hope that a health management system can change the working conditions in a way that skilled workers will be able to remain at their workplaces for a longer time. Such a system is currently being developed.

## **Image promotion of the company and of the technical occupations**

As one of the strategies in terms of recruitment problems, the company currently tries to improve the image of skilled work dubbed as “dirty work” within the framework of the numerous school co-operations. The attraction of the work in the surveyed die cutting centre is, however, reduced by facts like shift work and the need for skilled workers (or tool setters) to work “hands on” in the production.

The image campaign is above all realized through contacts to parents, the presence at training fairs and through events staged in the local schools. These measures should help to motivate the pupils to apply for training in the vocational technical field.

## **Company 2**

### **Framework data of the company**

The company investigated operates as a developer and manufacturer of fittings systems and special solutions in the field of industrial applications and employs 52 staff. The company is located in the region of East Westphalia-Lippe (referred to hereinafter by its German abbreviation of OWL). The company provides an all-inclusive package which encompasses project planning, construction, manufacture and service.

The company is a member of the OWL Engineering Network. OWL views itself as a regional branch network and as an innovation network whose purpose it is to strengthen the economic location and commits itself to promoting the regional image. The network is a consortium of companies from the engineering sector. Its aim is cooperation, including a regular exchange of information, experiences and knowledge, with the objective of strengthening the economic and technological performance of the SME engineering branch in the region. Creative solutions and practical experiences for current issues are exchanged.

### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

In order to secure further company growth, specialist workers are permanently being sought for both the technical and commercial sectors of the company. The consequences of the shortage of skilled workers are already clearly discernable within the company. The company has its own construction department and production facilities with lathe, milling and welding plants. The company is already experiencing significant difficulties in finding appropriate workers for these technical departments in particular. The increases in company capacity, which have been occasioned by rising demand, are leading to considerable problems with skilled workers in some areas. The glaring shortage of such workers is particularly evident in the construction department (engineers/technicians) and in the field of milling machine operators (specialist workers). This is having a significant negative effect on company expansion and is a development which is already leading to loss of production in some areas due to the fact that not all machines can be operated. One consequence of this is that two-shift production cannot be introduced.

Three main factors indicate the difficulty of recruiting new skilled workers and retaining the loyalty of key workers.

- Salaries are continually spiralling upwards. Compared to major international corporate groups, SME's have only limited financial power and often lose out

to competitors offering higher levels of salary. In addition to this, a “headhunting” trend is already becoming apparent across the whole of the branch. This both underlines the ferocity of the competition and represents a further hurdle for this company and other smaller companies as they struggle to attract skilled workers. “Skilled milling machine operators are riding an extremely high wave and are being lured away by head-hunters”. (Works manager)

- The attractiveness of a job offer is also subject to the influence of quality of life in the form of company image. A small SME does not have the kudos of international corporate groups such as Dr. Oetker or BMW, which are able to attract a much higher number of skilled workers simply by dint of the level of awareness they enjoy.
- The fact that the company is domiciled in the OWL region also means that it is disadvantaged in terms of the image of its location. This region is viewed nationally as being rather provincial and lacking in attractiveness, making it hard to acquire specialist workers from out of the area. The OWL ENGINEERING Innovation Network has set itself the goal of strengthening OWL as an economic location and is committed to fostering its regional image. The company is actively involved in supporting the network.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Promoting up-and-coming talent/fostering the image of the company and of technical occupations**

The establishment of further training capacities represents an important building block in the company’s struggle against the shortage of skilled workers. Nevertheless, the primary necessity is to inspire a basic interest in technical training and courses of study on the part of young people. A special concept based on ongoing monitoring of up-and-coming talent from childhood until the time they enter the world of work aims to address this situation. Getting the children and young people to experience the fascination of technology for themselves is viewed as the key to success. The plan is for them to be repeatedly and directly confronted with technology and technological occupational profiles during their various stages of development, thus enabling them to gather their own experiences.

Within the scope of this concept, the company has committed itself to a range of support projects in the OWL region by becoming actively involved with the design and implementation of viable concepts. These projects are described below.

## **Cooperation with the Villa Kunterbunt childcare centre- “Catching them early ...”**

Convinced that successful and sustainable work with young people needs to begin at nursery school level, the company has entered into a cooperation agreement with the local Villa Kunterbunt childcare centre to foster the instinctive interest children display. Every year, groups of children who are approaching school age and will begin formal schooling the following summer spend a morning in the company being introduced to “metal” as a material and the way in which it can be processed in a playful manner, experiments being one of the approaches adopted. Parallel preparations for this adventure day are also undertaken in the childcare centre. The day is followed up by a painting competition in which the children are once again encouraged to reflect on their experiences and adventures, and this enables the impressions they have gained to penetrate deeper into their memories.

## **The OWL “Talentarium”**

The company is providing both design and financial support for the planned OWL “Talentarium”. This will involve the development in future of modules for experiments which will then be made available free of charge. The OWL “Talentarium” is a vocational adventure house unique nationally in which children and young people will be afforded the opportunity to conduct various experiments. This will enable them to gain experience of their own talents and skills, these then being recorded on a talent card to provide a talent profile for the child or young person in question. The OWL “Talentarium” is aimed at children and young people of all age groups and addresses their own experiences.

## **Active knowledge transfer to schools**

In order to retain the degree of interest which has been aroused, children and young people still need to be exposed to vocationally relevant content on an ongoing basis during the course of their school careers. Active knowledge transfer from companies to schools is important. From 1997 to 2002 and working in conjunction with an intermediate secondary school, the company was involved in the “School & Co.” project. Cooperation with regional educational establishments is continuing, even though this particular project has now ended. This involves such activities as employees teaching technical or sociological subjects. A reciprocal process also takes place whereby teachers are able to obtain an in-company placement in order to gain knowledge which will be relevant to their teaching.

## **The transition from school to the world of work: BINGO**

Established projects in the field of supporting young people in making the transition from school to the world of work are already ongoing in the OWL region, and the company is actively involved in these. The “BINGO” initiative, a German acronym for

“Vocational initiative for engineers in OWL” is particularly worthy of mention in this regard. A “BINGO day” has been staged annually since 2002, the object of the initiative being to use young people’s own experiences as a vehicle for familiarising them with technical occupational profiles. The day features a theoretical element in which fundamental information is imparted to the young people, the idea then being for them to implement this knowledge by performing a practical task. The practical vocational relevance of the scientific and technological teaching content is brought home to the young people in a virtually peripheral fashion.

### **Vocational relay**

The vocational relays offered at the Minden-Lübbecke Technical Centre are a further project in this area. Young people stop off at various points to conduct experiments relating to typical occupational activities. Employees from participating companies are on hand to monitor and explain the experiments. The young people evaluate all the occupational profiles with which they have come into contact and match them against their own interests and the results of the experiments. When the day is over, the young people are thus provided with an overview of their interests and specific skills.

### **Vocational navigator**

The vocational navigator supports young people in selecting an appropriate training occupation or higher education course of study. The vocational navigator acts in the capacity of a trade and industry expert, using the correlations between the young people’s strength profiles and the recommended occupational profiles to chair the concluding discussions which take place. The vocational navigator is available as a contact partner and explains the requirements contained within the occupational profiles from the point of view of a practitioner, for example. The young people conduct a peer rating procedure in which they mutually evaluate certain personal characteristics. A computer aided assessment is then carried out to draw up a strengths and weaknesses profile which is then mapped against the requirements of occupational profiles.

### **Promoting technical occupations for girls and women**

The company stages a Girls’ day every year, inviting girls to spend a day within a technical environment and to obtain their own personal view of technical occupations. The aim is to reduce prejudices.

The company also works in conjunction with various institutes of higher education to provide an opportunity to pursue a “dual course of study”. One student is currently taking advantage of this provision. In addition to this, school pupils and students are regularly afforded the chance to write dissertation papers or complete practical

placements. In 2007 alone, three students prepared their dissertations in cooperation with the company.

The overall thrust of planning of company activities is for the medium to long term. As a consequence, the company displays a strengthened degree of commitment to raising the awareness of the workers of the future, the children and young people of today. This particularly applies in respect of the technical occupations.

### **Staff development**

The company puts its faith in a highly developed system of loyalty management. The aim is to establish a culture in which all employees feel comfortable and which strengthens team spirit. The plan is to develop specific measures which will feature employee involvement in the near future.

A further topic for the future is performance related pay. The company harbours the hope that this will increase motivation and team performance, although it is clear that this will need to be preceded by detailed communication with staff in order to reduce fears and reservations.

### **Investment in training/further training**

The company currently employs 6 apprentices in the areas of industrial clerk (two), milling machine operator (two) and industrial mechanic (two). In light of the fact that the company has just under 50 employees, this represents a training quota of approximately 12%. The company is a member of the Network BANG Training Network Gütersloh. Two young people, an industrial mechanic and a milling machine operator, are currently undergoing training in cooperation with the association. From the coming training year, the cooperation agreement will be used to offer training to two new technical trainees.

The association assumes responsibility for time-consuming teaching content and provides young people with instruction in such areas as basic craft trade skills (grinding, filing). BANG also offers theoretical instruction to supplement the teaching provided at vocational school. Although the content taught is relevant to occupational practice, it is no longer offered at vocational school and imparting it thus falls within the remit of the company providing training.

In the short term, the company is trying to provide its own employees with continuing training enabling them to be deployed in other areas. Knowledge transfer plays a major role within this process. A number of initiatives have been planned for the near future to document knowledge and transfer it better within a team.

### **Environmental management**

An environmental management system is currently being developed. Given the crucial role played by the environment nowadays, the company has set itself the

objective of introducing such a system. The aim is for it to document that products are developed, manufactured and packaged in accordance with economic and ecological aspects. A further objective is for business relationships to be accorded due consideration in terms of environmental aspects.

## Company 3

### Framework data of the company

This company is a motor vehicle service company dealing with the whole spectrum of vehicle makes, and could therefore be referred to in general terms as an “independent garage”. The company falls into the SME category<sup>9</sup>. It offers maintenance, repair and service provision for all vehicle makes and types on the market.

In terms of its legal corporate structure, the company is integrated into the LuK aftermarket sales organisation. The company is an initial equipment supplier of LuK discs and clutch systems, acting as an original equipment manufacturer (OEM) in supplying vehicle manufacturers with such components as clutches and drive chain systems. LuK itself is in turn integrated into the Schaeffler Group, which operates on a worldwide basis and also owns INA and FAG. As part of the company marketing strategy, LuK Aftermarket Service developed a service station system known as AUTOMEISTER at the beginning of the 1990's. For this purpose, a joint company was originally established in conjunction with the American group ITT, which also owned the ATE brakes division at the time. This company went by the name of KWK Krafftfahrzeug Werkstatt Konzept GmbH (*“Vehicle service station concept”*), an independent franchise system operator in equal joint ownership.

After three months of test and initial operations, the company was launched at the start of 2001, initially employing one motor vehicle mechanics master craftsman and two motor vehicle mechanics. The staff of the company was subsequently adjusted on an ongoing basis as the clientele developed and the volume of orders expanded and now consists of a total of eleven persons (2 motor vehicle mechanics master craftsmen, 6 motor vehicle mechanics and 1 commercial employee).

### **Situation and problems in relation to the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

The company exclusively employs trained motor vehicle mechanics master craftsmen, motor vehicle mechanics or motor vehicle electricians. The fact that the company is an independent garage rather than being affiliated to any specific make of vehicle means that an acute shortage of skilled workers is already apparent. Although it is a modern motor vehicle service workshop equipped with state of the art technology, independent garages are always still fundamentally dogged by a grubby

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<sup>9</sup> The main characteristics of an independent garage are that it does not have any kind of affiliation with any particular brand of vehicle, is not subject to the directives of any particular vehicle manufacturer and does not restrict its services only to one specific make of vehicle.

image, something which may well be fully justified in many cases. To this extent, qualified specialist workers often gravitate towards branded companies when seeking a job. This happens for two reasons. Firstly, a Mercedes or BMW car dealership enjoys a considerably better image than an independent garage, and secondly skilled workers are fully aware that joining an independent garage will mean that they will have to work on a wide range of different vehicle makes and types. This requires a much greater degree of flexibility and system knowledge compared with the work in a service company where only one make is repaired and where work processes often recur. In addition to this, skilled workers who are employed in a branded workshop enjoy direct and easy access to all the technical information they need and can also take advantage of the experience of their colleagues. This means that the level of effort required is not as high and that working life is structured in a relatively comfortable way. To this extent, and if such a polarised point of view is in place, this gives rise to the impression that only two groups of motor vehicle mechanics master craftsmen and motor vehicle mechanics are interested in employment in an independent garage: those whose inadequate level of qualification means that they have no chance of obtaining a position in a branded workshop and those who see employment in an independent garage as a specialist challenge and an opportunity for personal development given the variety of types of vehicles and different technical systems to be dealt with.

The rapid pace of technological development in vehicles constantly presents the employees of the garage with new challenges. The innovations taking place in the electrical and electronic field and the resulting diagnostic technology and technology deployed for trouble shooting in electronic systems are areas which should be emphasised in this regard. All vehicles now feature networked electronic systems for engine management, drive chains, security features and comfort fittings, and fitters need to be in possession of a full knowledge of these. The reality is, however, that mechanics often lack systems knowledge and know-how and can frequently be found adopting a fatal basic attitude. Thus even motor vehicle mechanics who have completed their apprenticeship relatively recently are on record as expressing the view that “anything attached to a cable is not part of my job”.

Recruitment of suitable trainees and skilled workers from the open labour market for the areas of motor vehicle mechanics, mechatronics or electrics is proving extremely difficult. No clear strategy is discernable within this company. Placing job advertisements in the usual specialist press and regional daily newspapers has yielded little success hitherto. Although the company has now already also switched to commissioning recruitment agencies (headhunters), this has proved extremely costly in some cases and has also brought little in the way of success.

Documentation of knowledge does not take place in the classical sense within the company. Although the technology hotline has an extensive technical information database, there is no systematic documentation of the knowledge which exists and has been acquired in the workshop despite the obvious opportunity to document

such knowledge and the inherent value it would have. To this extent, the same thing applies in this company as in many others: anyone leaving the firm takes their know-how with them.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Personnel development**

The garages which are affiliated to the AUTOMEISTER companies are provided with extensive provision of initial and continuing training (over 1,000) courses for company managers and staff alike via the system's headquarters. All franchise companies enter into a commitment to provide their employees with ongoing training in accordance with their requirements and in all relevant areas. Annual training provision for each company is planned on an individual basis for each company in conjunction with field staff. Each employee is issued with a personal training passport documenting all training courses which have been attended. Compulsory training participation for company managers includes attendance at conferences held for the purpose of exchanging experiences (known by their German abbreviation of ERFA) which are held twice a year. The main focus here is on imparting management and organisation topics and on communicating branch information.

Staff development takes place via employee interviews held annually. A personal interview is conducted with every employee, both the specialist craftsman directly responsible for the employee and his disciplinary line manager also being in attendance. The contents of the discussions are documented in staff appraisal questionnaires which have been specifically developed for the purpose, and these form the basis whereby specialist or personal development compared to the previous year or to the whole of an employee's company service can be discerned. During staff interviews with the master craftsmen, targets for the coming year are agreed, and recognition and analysis of whether these targets have been met or any necessary redefinition of targets subsequently take place. The granting of bonuses may also be linked to the degree to which an employee has met his targets.

### **Investment in training**

The company is putting its energies into finding suitable trainees and generating its own supply of up-and-coming skilled workers, harbouring the hope that such trainees will choose to stay with the company once they have successfully completed training rather than deciding to move to another company or being lured away.

Even before the motor vehicle service company was founded, the management of the franchising system head office stipulated that the company should be a company which provided training, and it has been doing so since 2001. The principle is that

one trainee should be taken on per year, although the company also sometimes takes on two trainees per year if it receives applicants with good school leaving qualifications.

## **Good Practice Examples Italy**

### **Company 1**

#### **Framework data of the company**

Company 1 "...owes its fame to its history, rooted in the technological revolution that swept through the electronic and mechanical sectors in the 1920's.

Today the Bologna-based company boasts a staff of almost 350 and occupies a surface area of 40,000 m<sup>2</sup>. The company focuses on four core sectors: the production of capacitors for electro technical applications, the manufacture and sale of energy meters, the manufacture of generators and the sale of electronic measuring devices.

With market a share ranging from 30 to 40%, depending on the sector, Company 1 occupies an unchallenged position of leadership within Italy".

#### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

During the last five years the most important change has regarded the products and not the technology innovation. Consequently, the products innovation required new technical profiles able to deal with new organizational and logistical needs. These professional profiles can be identifying as a skilled workers.

Within the company the skilled workers are all the professionals, with an intermediate level, which must have competences related to the know-how of the process occurring within the enterprise.

This intermediate professional should be able to transferring their know-how in different context in which their work (also foreign).

Is important underline as the professional with an intermediate level comes more and more required, countering to the traditional workers. In addition tending to vanish the difference between skilled workers and engineers is vanishing.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

For the survival of the enterprise are necessary a professional able to manage the process. This professional, called Product manager must have knowledge skills and competence useful to:

- Interact with other professionals;
- Interact with different contexts in which work take place;
- Transfer his/her competences in different “environment system”;
- Have complex overviews despite the contexts in which work take place.

Within the company there are four main ways to recruiting the skilled workers:

- relation with schools;
- clearing of vacancies (formal: i.e. public announcement; informal: informal relation among people);
- web site of the company or job web site;
- private job agency.

Within company 1 it was always difficult to find qualified workers. This problem is related to the difficult match between schools and world of work. Nowadays, according with the people develop manager interviewed, “the professional schools does not matching with the real needs of the world of work”. And than “...it becomes necessary to enhance the quality of cultural level<sup>10</sup> within all kind of the schools”.

According to people develop manager the following professionals profiles (skilled workers) can be identified as a critical factor (if does not take measures to keep in pace with the product and market changes) for the development of the enterprise:

- Professionals that work in the quality area (process/system: high level quality management personnel);
- Professionals that work in the commercial area;
- Professionals that work in the managerial area (i.e. Products manager).

In particular, following the words of the person interviewed, “...is really difficult to recruit professional as Product manager”. And than, “to try to solve this problem, comes organised “internal career programmes” when the worker comes deep involved in different process, contexts and experiences inside and out of the enterprises.

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<sup>10</sup> Cultural level: this expression has been used by several professionals interviewed that had the idea that actually, the vocation schools are not close enough to the actual need of the world of work. Thus the enhancement of the technical culture will be a necessary step to improve the quality of these schools.

Through this internal career can be creates all the professional profiles useful for the needs of the enterprise.

## Company 2

### Framework data of the company

Company 2 "...was incorporated in 1956 to meet the growing demand from the mechanical engineering industry for spare parts and precision components for agricultural machinery and motorcycles, both flourishing market segments at that time in Bologna area.

In subsequent years the company went on to manufacture a range of new gearboxes entirely designed in every detail, initially supplying them to firms in the Bologna district operating in the packaging sector and gradually extending sales to businesses throughout the whole of Italy.

Today the company has production plants and branches in 13 countries, with a global workforce of more than 1900 and a turnover in excess of Euro 388 million".

### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

In the last five year the changes occurred in the technological field at shop floor level, have involved all the enterprises functions. Professional structure has seen a variation in few workers profile in terms of skills, competences and tasks required. Nowadays, according to the person interviewed, the main competences should be "English language and informatics" (i.e. the professionals being able to use several software to manage the production process, machines etc.). And than, "the internationalization process<sup>11</sup> required the capacity of the workers to problem solving in different context in which he/she operates".

In relation to the above mentioned change, during the last five years new professionals profiles was emerged, such as:

- key account manager<sup>12</sup>;
- product manager,
- commercial;
- logistics...

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<sup>11</sup> The internalisation process is related to the delocalisation of the enterprises. This change requires professionals (at all levels) to be able to cope different problems in different machines, or in more general in different manufacturing processes.

<sup>12</sup> The key account managers are the professionals responsible for the management of commercial relationships with major customers. These managers monitor the achievement related to the selling of objectives.

Furthermore in the next five years organizational changes will take place both at shop floor level, with the increasing of the electronics machines; and at organizational level with deep changes in the commercial and productive areas.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

According to the people developer manager there are at least two treats linked to enterprise development. On one hand, the office workers more and more must acquire and develop logistic competences; on the other “is very difficult to find specialised workers”. To solve this problem, the strategy followed by Company 2 consists in recruiting adult workers with a few years of work experiences in the sector. (Even if recently the company seeks to train internally young workers<sup>13</sup>).

In the last five years the company has introduced e-learning<sup>14</sup> as a formative strategy to training the commercials. The aim was to provide new competences and skills that are useful to maintain the competitiveness of the enterprise within the global market. Furthermore the e-learning programme aims to strengthen technical and products knowledge skills and competences of the commercial. The e-Learning environment for example should be characterised by the following elements:

- Knowledge base area: in which all the participants/external users can share information on: i.e. the activity of the enterprises, the history, the people who work etc;
- Restricted area addressed only for the training activities, addressed to the employees. In this area the employees can:
  - self evaluate their competence related to particular/general productive process;
  - Find an opportunity of learning personalization<sup>1</sup>: learning the technical procedures through simulation activities; share information, opinions, and experience through the use of blog, forum or wiki tools; develop new knowledge through the activities carry out in community of practice.

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<sup>13</sup> In this way it is to simple to solve the internal problem related to the transferring of knowledge, skills in using machines such as numerical control machine, wood-turning, gear cutting and so on), which are different in relation to the enterprises and processing.

<sup>14</sup> The European commission defines eLearning as “... the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchange and collaboration.” See: eLearning Action plan 2001, European Commission.

Once a year Company 2 previews to gather the formative demands through the request to identify the formative needs differentiated per areas.

Within the company there are two main ways to recruiting the skilled workers:

- relationships with schools;
- News paper insertions.

According to the people developer manager "...is really difficult to find skilled workers"<sup>15</sup>. In particular the manager underlines as "within the Emilia Romagna region, the mechanical culture tradition being disappearing".

Every year both technical and professional schools have fewer students enrolled. To face this lack, workers with low qualification (i.e. immigrants), come introduced within the production, for example in the assembly activities.

Actually the young Italian students (graduated) are not interested and motivated in working as workers within enterprises: They do not want to work in craftsman jobs. This is one of the consequences related to the changes of the value system<sup>16</sup>.

Finally, following the word of the people developer manager, "...becoming important to underline as, before to work in the direction to developing new qualification (at local, national European level), there is the need to work to *recreate a manufacturing culture*.

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<sup>15</sup> Even if "the technology evolution could require less workers within the process".

<sup>16</sup> For example: several contemporaneous families seen as bad opportunity addressing their son in vocational schools. The service sector and other kind of qualification/diploma are privileged despite the technical schools. This is not true, e.g. for the immigrants who work in Italy. They have replaced several low qualified Italian workers and they are fundamental resources for the enterprises' survivals. As we can understand, these changes are strictly related to the shortage of skilled workers.

## **Company 3**

### **Framework data of the company**

This company is a company in step with the times specialized in the production of dies and shears, electrical discharge machines and wire-cut electrical discharge machines working, sheet metal working with presses up to 400 tons.

The owner was born in 1969 and has a craftwork origin, typical of the Emilian economic system.

Nowadays the company is built on a 4.000 m<sup>2</sup> covered area and have capacious logistic spaces. The experience gained in these years contributed to give an high productive standard that is the result of a steady engagement in research.

The qualified company's personnel can face the multiple design problems taking the cue even from a simple idea of their customers. Since the project study, the technicians are able to face each necessity of their customers following the product from its development to its industrialization.

### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

In the last five years in Company 3 important changes in the professional structure happened. Those changes highlighted the need to move some workers from manual labour to CNC machines. These workers had to have specific technical skills that can be obtained through an informal training.

### **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

The personnel work placement path changes according to the professional that has to be placed in the company. For example the work placement path for a production engineer is this:

- Explorative phase: getting to know the production procedure
- Training phase: 1) training in using the machine, given by qualified personnel or extramural experts, training in software usage (work on computer abilities, external education)

According to the interviewed person, the most crucial professional for the company development is the qualified technical personnel. The most required skills, that also

are the most difficult to find in workers are the ones about using the information systems and about reading mechanical design.

The principal way in which skilled workers are recruited is a strict bond with schools and polytechnic schools in particular. To face the problems in recruiting such professionals, the company adopts a “global involvement” strategy. Such strategy gives satisfaction to the workers.

The involvement of the workers in the entire productive process, on one hand allows them to obtain transversal skills, on the other such involvement, strengthen the bond between the individual and the company.

According to the technical director interviewed: “Schools should bring people near to the labour world. Is necessary to create a stronger weave between school and the labour world, encouraging for example internship experiences. In the school world happen very often that the students have to deal up with obsolete technologies, different from the ones in the modern labour world.

## **Good Practice Examples Netherlands**

### **Company 1**

#### **Framework data of the company**

This company is part of an international company and has 950 employees on the location we visited. It produces sheet metal parts for car manufacturers.

The company doesn't have its own product. It tries to spread risk by supplying parts to several customers. By focussing on service parts the company tries to distinguish itself from its competitors.

About 25% of the employees have a certificate at the level of preparatory vocational education (VMBO), about 60% has a certificate on the level of secondary vocational education (MBO) and about 15% on higher vocational or academic education level.

The manager and two staff members of the human resource department are engaged in formulating and executing training plans for both existing and new personnel.

A company school is part of the HR-department.

#### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

Because of a reorganization the number of indirect jobs has decreased, in favour of the number of direct jobs (= directly related to production).

As a result of a strategy change the company is currently expanding the assembly department. In a few years it has grown from 50 to 250 people. For the next five years an increase of 100 more employees is expected.

The average age of the employees is 43 years. For a few positions (for example toolmakers) the HR-department foresees problems with replacement of employees as the employees working in these positions are relatively old and there are not enough people available.

#### **Further training for employees**

About 50% of all persons that are recruited have a qualification level of preparatory vocational education (VMBO). About half of these workers reach the educational level of secondary vocational education (MBO) through internal company training. This internal training system consists of modules. Within this system the company

registers and steers on the (development of) competences of their employees. Participation is compulsory for certain functions in the company. For certain functions in the company it is even obligatory to finish one or more modules with success.

For workers with a temporary labour agreement, not finishing a module could have consequences for continuation of their work at the company.

The finishing of modules of this internal training system does not provide the workers with official recognised certifications. The company would like it if their training system could lead to officially recognised certificates. Transparency of certificates and qualifications of workers would improve, also outside of their own company.

The company sees this internal training system as knowledge management.

The company also has a programme to actively work on an attractive working environment for all groups of employees. The program focuses on: improvement of working conditions, enhancing safety and health and supporting the personal development of employees. By several measures the company tries to achieve a positive working climate, in which the employees can work in a suitable job, now and in the future.

As in every large company, there is an employees' council. It is actively involved in discussions about the company, the personnel and training matters. It has a tendency to protect employees who are less ambitious where (further) training is concerned.

An important development is 'lean thinking' or 'lean production'. To do more with less people, those people have to be smarter. The company has 'value stream coaches' who have to coach 'lean teams'. Lean thinking and lean production asks for personnel with more competences.

Recently there has been a shift in the company strategy. The accent is now on service parts for automobiles, and less on the production of parts for new cars. With this shift of strategy a shift in importance of production departments occurred. The assembly departments, with other production techniques, became more important than the press shop. This meant that different personnel with different competences is needed. This had consequences for the recruitment and the internal training of these employees. This especially applies to product finishing.

Because of shortages on the labour market, some internal training programmes have been started (for example: product finishing).

The shift has also consequences for the priorities of other departments. If something goes wrong in the assembly department the maintenance department has to react more quickly than if another department was involved. For the near future the changes that have started will be continued.

A more recent change is the use of new welding techniques. In general the complexity of techniques is increasing, so more technical knowledge is needed.

The company works more than before with emergency outsourcing orders coming from car manufacturers which asks for more flexibility of its workers.

## **Recruitment**

Several recruitment channels are used: public relations activities, newspapers, internet, and contacts with vocational schools, job markets and sponsoring. The public employment offices (CWI) don't play an important role. In the past the company was often not satisfied with the applicants sent to them. At the moment the company is especially looking for welders and product finishers for the assembly department. Vacancies like these are difficult to fill.

## **Criteria for recruitment**

The main selection criteria are working experience, at least a relevant secondary vocational education and willingness to learn. Sometimes new employees without the 'right' education, but with a good working attitude and willingness to develop turned out to be very good employees.

The current recruitment problems are partly due to the business cycle and partly due to a change in demand from the company (because of the shift in strategy).

Recruiting skilled workers from Eastern European countries is not something the company is considering on a large scale.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Involvement in training and contacts with vocational schools**

In the company school young people start their apprenticeship in the company. Here they get practical training and in the departments they get to know the real work. Each department has a co-ordinator who gives guidance to the pupils who are placed in his department from the company school. Each year the company school has about 60 pupils (15-20 on level 2 or 3; a large group of welders on level 1 of the Dutch vocational education system). Pupils are selected for the company school by an interview, a practical test and a theoretical test. Sufficient pupils apply for an apprenticeship (both through schools and informal channels). Only a few pupils leave the company school before they have finished the program. Some of them leave the company in a later stage, because they discover the work isn't right for them. The company school still exists - while many other firms closed theirs - because for some functions no vocational education programs exist. It is expected the company school will grow in the future.

The company experiences that the vocation education programmes on levels 2 and 3 have become more narrow. The company training school has to cover for that (especially mentioned are drawing reading and (metal) constructing).

Five years ago the company, in cooperation with vocational schools, started with programmes related to assembly and electrical engineering. The reasons for this were changing machines and the introduction of robots. The programs of the vocational schools on the levels 2 and 3 are considered too narrow, compared to the past. This is compensated in the company school, where pupils learn more about reading drawings and metal constructing.

In the Netherlands a shift is made to competence based education. The company works with some vocational schools in experiments.

For some programs, teachers from these centres give theory lessons within the company.

### **Further training**

At the regularly held job evaluation interviews between managers and their employees one of the subjects discussed is the personal development plan. The need for further training is a part of the personal development plan and is determined in each department. All proposals for further training are combined by the HR department. The total training plan has to be approved by the board of directors. Training activities can follow several tracks: company school, internal and external welding courses, internal training programme, vocational schools. In the company there is not a strict separation between (initial) vocational education and further training.

If possible the company uses ESF-subsidies for their (further) training.

### **Recruitment**

In the past the company has had a special project to recruit women. This was not very successful, probably because of the three shift system the company works with. However, some of the women who were recruited then, are still working in the company.

## **Company 2**

### **Framework data of the company**

This company has 45 employees and produces industrial parts by means of CNC turning and milling. It's an independent family company, founded 50 years ago. The firm is located at the Dutch-German border, in a region with a historical specialization in iron casting.

Metal and plastic parts are made for manufacturing firms, in series between 50 and 1000. The maximum size of the parts is about 70 millimetres. Both metal and plastic parts are made. The parts are made by CNC turning and CNC milling. Turning is more important for business than milling. In addition to these operations some assembly is done, using connection techniques like gluing and welding. Most of the customers are located in the Netherlands and only a few in Germany. The company doesn't suffer from competition, not even from low-cost countries.

Total employment is 45 people. During the last three years employment has increased with five jobs. According to their education, 5 employees are unskilled or semi-skilled, 38 skilled, and 2 have a higher level. The company is striving to increase the educational level in the company. Most of the employees are in their twenties or thirties. Turnover of personnel is low. The company employs six Germans, to the satisfaction of both parties.

### **Situation and problems in terms of the shortage of skilled workers (What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

#### **Recruitment**

Recruitment is done mostly through informal channels. Internships, weekend and holiday jobs are ways to get to know metal working and is also a method for the company to get new employees. Sometimes young people who were not following a technical education and did holiday work at the company, got interested in technical work and switched to a technical education.

The employment office in the region (CWI) is not used to recruit new employees, because they are not able to deliver suitable applicants. The employment office has no people available and also the people working at the employment office don't have the right knowledge of the metal professions concerned. The company has better experience with the employment office on the German side of the border. From this office the company did have some employees. It was however difficult to compare qualifications of German employees with the ones of the Dutch educational system. The company didn't have enough idea of the competences of the German people

when they applied at the company. The German employment office could not help them in this case.

At the moment there are vacancies for an experienced CNC turner and an experienced CNC miller. Both vacancies are hard to fill. It is not that difficult for the company to get inexperienced turners and millers. They do this mainly via informal channels, as written above. But experienced ones are very hard, maybe even almost impossible, to find.

### **Criteria for recruitment**

The main selection criteria for new employees are their education (level and specialisation), experience and – more specific - the machines people have worked with. Personal aspects are also important. They need to fit in the working team. They need to give a reliable impression and should be able to work together and communicate.

One of the criteria that make it more difficult to find new and experienced employees is that they must be able to work with different machines. The company has different machines and for continuation of the work it finds it preferable that employees are able to work on more than one type of machine. Also the fact that the products the company is producing are getting more complex and require a higher precision, asks for technicians that have more technical knowledge. These technicians are hard to find. Because conventional machines have been replaced by CNC-machines programming skills have become more important. To find experienced people with programming skills is a problem.

### **Further training for employees**

New employees are told from the beginning of their work at the company they are supposed to follow further training courses.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Involvement in training and contacts to vocational schools**

The involvement of the company with secondary vocational education is different by level:

- For level 2 apprentices the company is affiliated with a regional practical training centre. This centre carries out the practical training for the level 2 apprentices of the company.

- For level 3 apprentices (CNC machining) the firm itself is responsible, though use is made of support by Kenteq (MentorPlus). Kenteq performs the guidance of the students at their practical training in the company.
- On level 4 (mechanical engineering) education is not in the form of an apprenticeship but as a full time scholastic training with only a few periods of work experience in a company. The company aims at level 3 as the minimum level for all employees. This ambition makes it more difficult to find suitable people.

The company regularly has contact with school, but is not satisfied with the support their pupils get. The schools don't have enough contact with the company and has not enough technical expertise to guide the students and to prepare them for the company part of the training.

The educational programmes of the secondary vocational education are not satisfactory to the factory manager. The programmes are too narrow and deliver insufficient knowledge of materials and mathematics. Some of the programmes are too much 'fun oriented', because schools want to make it easier for the student to finish their training successfully. Most of the pupils starting with a secondary vocational education have learned insufficient skills during their previous education (mostly preparatory vocational education; VMBO).

### **Further training**

Further training is stimulated strongly. Employees are encouraged to take up almost any kind of further training. This means that it is not always necessary that the training has to be of direct interest to the firm. Needs for further training are determined by means of performance interviews, error reports of machines on which the employee has worked and by accreditation of prior learning (APL; in Dutch EVC). For the latter external assessors are used. The result of an APL can be a certification and / or an advice on further training.

## **Company 3**

### **Framework data of the company**

The company produces industrial parts by means of CNC turning and milling. Most of the products are very large in size. When needed for the finishing of a product the company also does some welding.

It's an independent family company, founded 13 years ago. The firm is located near Rotterdam, in an area with port activities and ship building.

The company doesn't have its own product. Parts are supplied to other manufacturing companies in a broad range of sectors (for example: food processing, dredging, ship building). Examples of products are ship rudders and worm shafts. The main activities are turning and milling of metal by means of CNC machines. Both operations are equally important. The parts produced are often very large (ranging between 9 millimetres and 6 meters). The series are small, mostly less than 20 pieces. Also some metal construction and welding is done, but only as an addition to the turning and milling activities. Only one person is involved.

The firm gets his orders by 'mouth-to-mouth advertisement'.

### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

#### **Company philosophy**

Up till a few years ago the company had the philosophy to take on all the work that was offered to them, their idea was that refusal was not done. This led to problems with delivery time. Another aspect that contributed to the problems with delivery time was the bad organisation of the work. So the production process did not run very smooth, and the company did have problems with the judgement of orders (whether to accept them or not) and the planning of the orders (delivery time). Recently they made a change and are now more critical on acceptance of offered work. They now look at their planning and also judge if the product that is required fits their production method. With this change delivery time has become less of a problem.

#### **Human resources**

The company employs 20 people in total. 17 of them are working in production activities. The company started as a one-man business and has grown until a few years ago. A few years ago the decision was made to not grow any further, because that would require moving to a larger building and changing the organization structure.

Most of the employees are between 18 and 35 years old, four are about 50 years old. Turnover of personnel is zero. Because of the relatively young employees and the zero turnover of personnel, the company does not fear problems with loss of know how because of turnover and retirement of personnel and replacement of (early) retirement of personnel.

No HRM department or specific function exists in the company. The company doesn't have a system of knowledge management, because the company is not afraid employees will leave the company. On the other hand, it became clear that too little information (about orders) was documented, when the owner became ill. This led to thoughts about clarification of structures and writing down information on orders, clients and other contacts. This has only been realized partly up till now.

Since about five years the company has problems recruiting new personnel. Especially experienced personnel they cannot find.

### **Day to day work**

Each employee is linked to one machine and knows all about it. Programming of computer-controlled machines is done at the machine.

Because the materials that are being used are very large and the materials are expensive because of their size and the time it takes to produce one piece, there is a large damage risk. The operators therefore have to watch the machine all the time while a product is being produced.

For milling only CNC-machines are used. The six milling machines all have the same control system.

Almost all of the turning machines are computer controlled, only a few conventional machines are present. The computer-controlled machines do not all have the same control system. A loss of know how could be a problem here, when a worker leaves the company.

Normally employees do not switch between machines. This is a possible risk when a worker leaves the company or is absent unexpectedly. There is no simple substitution of workers. This risk is bigger for the automated turning machines the company has, as these machines don't all have the same programming system. The milling machines, although they are different, do have the same programming system.

### **Further training for employees**

Further training for employees is not stimulated by the management. No employee has ever done any further training in the 13 years the company now exists. If a worker would like to do a further training it is up to the employee himself to go to the management and to bring about the subject. There is no policy of the management

on how to handle such a request. The owner and factory manager couldn't say how they would deal with such a request because of the lack of policy and experience.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Involvement in training and contacts to vocational schools**

Until last year the company had two new apprentices each year. At the moment there are two apprentices who started last year, of which one is female. They follow a course in conventional turning and milling at level 2 of the Dutch secondary vocational education system. A large part of the time they do production work. The factory manager and one employee on the 'shop floor' guide the apprentices as their education is concerned (both are recognized as practice trainers by Kenteq). Most of the apprentices stay at the company after they have finished their vocational training.

Once a year the company is visited by someone from the school. The respondents are not satisfied with the teaching methods of the school. Basic knowledge of students is too little and pupils also often lack motivation. Their skills have diminished over the last years. The company does not undertake any actions to change this.

Momentarily no new apprentices are taken into the company because the priority of the company is to improve the processes and the structure of the company. Apprentices would take up too much time.

### **Recruitment**

New personnel is recruited through advertisements in the regional edition of a national newspaper. Automatically these advertisements are also placed on a website.

No use is made of the public job agency (CWI), because it is not considered effective. At the moment there are vacancies for a CNC turner and a CNC miller. The last five years it has been difficult to find suitable candidates for these jobs. Applicants are selected mainly on their technical skills. Experience is not required because in the view of the company they cannot get any experienced skilled workers anyhow.

The company is prepared to employ older employees.

The company is not involved in activities to improve the supply of skilled workers in co-operation with other firms or organizations (for example by promoting work in metal occupations).

## **Good Practice Examples Slovenia**

### **Company 1**

#### **Framework data of the company**

The company in this report was formed by merging two former companies that had operated since 1959. With its establishment in 2001 it became a part of the parent company, which consists of 25 subsidiaries, operating in eight countries. At present, the company employs 833 staff while in the parent company there are around 7000 employees. The company records continuous increase of income, which in 2007 amounted to €71 million.

The major business field of the company is manufacture and development of assemblies for automotive industry. Basic technologies implemented are gravity pouring (gravity casting in shells), processing of metal products and welding. Manufacture process in processing of metal products is performed on NC and CNC machines arranged in production lines.

Their most prominent customers are from the field of European automotive industry. The company deals with each customer individually and their activities are aimed at total dedication to their customers and retaining the existing customers.

The company's business field is a highly competitive industry sector where only knowledge and innovation, collaboration with universities and institutions, as well as creative and dedicated employees, can give a cutting edge.

The company continuously strives to optimize production process. In order to keep up with the competition, the company continuously invests in modern technological equipment and introduces new production lines. They introduce new technologies in order to improve a more effective process-control, quality of product manufacture and competition.

The company management is aware that for the quality, it takes all of them; for non-quality, it takes only one. Business management was organised in compliance with quality standards, in particular those in the field of automotive manufacturing.

#### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

In the company's local area, the production industry faced enormous crisis in the 90's of the last century. Many enterprises went bankrupt. All this reflected negatively in the young people whose interest for professional education programmes receded, in

particular in the field of mechanical and electrical industry. Parents were reluctant to let their children start a profession where they themselves became redundant. The work was shown as unreliable, hard and dirty. This resulted in a shortage of a whole generation of skilled workers in the labour market. Older workers, who kept their jobs, are retiring, and there are not enough younger, qualified skilled workers, who would replace them.

The company employs experts from the fields of mechanical engineering, metallurgy and economics. Predominant are skilled workers with the education level IV (turner, cutter, locksmith), followed by the workers with the education level V (mechanical technicians).

Due to shortage of skilled workers in the labour market, the company has to employ staff that is not from metallurgy branch. Such workers are suitable in particular for work in serial production (production lines), where work-tasks are exactly defined by standards and procedures. For such work workers are required who are willing to be trained for the workplace and adopt the company's rules, hierarchy and management system. These workers are expected to be willing for work, training and gaining functional literacy (reading and comprehending instructions). Workers from non-metallurgy branches require more supervision and in-company training in order to operate machines. Among the non-metal branches, the company has had best experience with workers from textile industry. Due to crisis in textile branch there is large number of workers in the labour market. They are trained for the work-tasks at the production line and used to repetitive moves, and therefore they quickly seize the work process in the company. The training usually takes one week.

It is obvious that these workers cannot progress in the company's hierarchy; they cannot be promoted to production line operators, heads of departments or to shift leaders.

Skilled workers in metallurgy should have the knowledge of materials and basic work operations in the field. In recent years, shortage of skilled workers in metallurgy has become obvious.

The company became aware that the role of technicians has changed. These are pupils who have completed a four-year secondary vocational education. Research is not in their domain, they have turned into operators. New workers are machine operators (mostly CNC), later they are promoted to line operators, heads of technical department, and heads of maintenance departments. Consequently, their competences have changed. They have to attain more knowledge on CNC machines, leadership, psychology, teamwork and production management. Basic knowledge of metallurgy is not imperative. The company expects pupils to gain all this knowledge during their new formal education programme Mechatronics Technician, which started to run in the last school year.

Problem is seen in the fact that schools encourage pupils to continue their education after the three-year professional education (another two years) in order to become

technicians. This is the case with the best pupils. The branch, however, is losing its best skilled workers in basic professional branches like turners, cutters, locksmiths and metal finishers.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Further development of employees**

The company provides education and training for all employees, who will later occupy the key workplaces in the company.

The blueprint for staff development is drawn up by taking into account the results of annual interviews between management and other employees. By analysing the interviews, they plan training and relocate staff along horizontal or vertical corporate lines. They contemplate changes in line with the interests of the company and its people.

Most courses and training (85 %) are carried out in the company, in their own classrooms and in their own production processes. This way they provide faster transfer of knowledge among workers, reduce organisational costs and set basis for a 'learning enterprise'.

The head of the department is responsible for training in his department. In December and January, the Personnel manager, together with heads of departments, decides the priority of knowledge and competences the employees require.

Workers attend education and training outside the company, in particular to attain formal education (to gain state-recognised certificates). The company is willing to support formal education in professions that are in compliance with company's strategy, since the workers gain broader knowledge, higher motivation and personal development, but not much broader than needed for their workplace.

### **Investment in education and training**

Realisation of company's strategic objectives, exacting technological work and improvements require extensive, goal-oriented investment in knowledge and skills. Education and training increases employees' personal development. In 2007 the number of training hours reached an average 41.7 hours per employee.

Mostly education and training is involved in:

- interpersonal communication and team work,
- language courses,

- quality assurance - 6 Sigma<sup>17</sup>,
- project work in programmes Catia, Unigraphics, Pro/engineer,
- computer courses.

The workers have to be aware that they represent a part of the business process and that they have to take active role in this process. They have to be aware of the importance of quality and environmental protection. They have to be dedicated and take part in continuous education and training. They have to understand company's business policy and cooperate in achieving strategic goals, set by the company.

### **Qualification of semi-skilled and unskilled workers**

Regardless professional education of the individual performing tasks in production, additional procedures are required regarding training of new workers. These procedures are universal, regardless whether the new worker comes from the field of metallurgy or not.

For each new worker training is provided in order to get familiarised with the new workplace in the range of about 40 hours. The training also includes Introductory Course where new workers are introduced:

- company's organisational structure
- business collective agreement
- quality policy

The workers thus gain internal certificates of being qualified for work-tasks in a certain workplace or for a certain work operation.

Adjusted training is carried out when a worker is re-located to another production line or inside the production line, when the worker is trained for additional work-tasks – qualification for operating more than one machine.

### **Image promotion of the company and of the technical occupations**

Since the company is trying to raise interest for deficitary professions, it organises promotion activities in order to encourage young people for this kind of work.

They are aware that in most cases parents decide about the professional education of their children. This is the reason that the company organises Open Door days where pupils and their parents are invited. They want to show parents and pupils that conditions in this branch have changed, that work in metal industry is not so dirty any more.

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<sup>17</sup> 6 Sigma is a method for quality assurance.

The company invites headmasters and career advisors from primary schools. They are presented company's work and workplaces in order to be able to encourage pupils to choose deficitary professions. The company supports activities of technical clubs<sup>18</sup> and donates to competitions in the field of technics and technology in primary schools.

To vocational schools, the company offers workplaces for practical training during the time of pupils' formal education. The company is aware that in this way the pupil has an opportunity to learn about the company and its operation. In addition, they meet young people whom they can explain about the possibilities of grants/scholarships, promotion opportunities, further education, and try to recruit them for work in their company.

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<sup>18</sup> Technical clubs mean voluntary activities for children in primary schools, the content is focused on technics and technology.

## **Company 2**

### **Framework data of the company**

The company was established in 1994. It is located on a site of former company with 1400 employees which had to close due to bankruptcy. The company started its operation with 30 employees and 0,9 million Euro of sales income in the domestic and foreign markets. At the moment there are 95 - 100 employees and the company creates up to 5 million Euro sales income.

The company manufactures metal products, machinery and equipment. It has its own production programme which includes manufacture of tractor loaders, truck lifts and cauldrons for transporting cast asphalt. It also manufactures products according to the customer's documentation. In the range of vacant machine capacity they offer production services with the use of the customer's or their own material, in particular for material cutting, machining and production.

The company aims toward export since foreign market constitutes approximately 80-90 % of the total realisation. Its most prominent customers are from Germany, Austria, Italy and Sweden. Its foremost advantage is its excellent engine park, in particular for machining of large dimension products. Qualified skilled workers can manufacture products of high quality and in the appointed time.

Company's vision is to continue with the growth trend, long-term development of its own products and services in the field of cutting, machining and manufacture of metal products and constructions. Its objective is to establish long-term strategic partnerships with foreign partners.

### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

The company employs mainly skilled workers with the 3-year vocational education (welders and product finishers), followed by workers with the 4-year vocational education (mechanical technicians, CNC operators). The workers are skilled and qualified for work on CNC machines, technology development and team leadership.

At the beginning the company had no difficulties in employing skilled workforce. Then there were many unemployed skilled workers due to bankruptcy of the former company. The first employees were mostly skilled workers of middle age with suitable qualification and many years of work experience. Today these workers are retired or nearing retirement. Young people do not decide for vocational education. The company therefore faces the problem of recruiting new workers.

The company has no long-term plan of education and training of its employees. They adapt to the current needs. Nevertheless, priority is given to general competences, which will in the future be of great importance. For the company, systematic knowledge and experience transfer among the workers is important, especially from the older to the younger ones.

In accordance with the company's guidelines in the vocational field they are going to encourage education and training in the field of welding, technology of treatment and metallic coating.

In the future, the company envisages maintaining similar production programme. It is expected that the range of strategic partners will expand or change. Therefore, the company management does not expect radical changes in skilled workforce requirements.

Company's vision is to continue with the growth trend, long-term development of its own products and services in the field of cutting, machining and manufacture of metal products and constructions. Its objective is to establish long-term strategic partnerships with foreign partners.

From the future skilled workers the company expects more practical training to be included in their formal vocational education, in particular training in work process. This would provide pupils with skills for real work already during the time of their formal education in schools.

In particular, the company lacks skilled welders. In case of larger projects additional skilled workforce is drawn in. The contract workers have proven to have less absences from work and are willing to work overtime and during holidays.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Further development of employees**

The company does not plan career improvement, education or training for each individual employee. In accordance with the envisaged company development strategy, department managers define skills and qualifications needed for achieving the objectives set by the company. The company then provided such courses and training to the employees. Also, employees themselves can express a wish for specific course or training. If their wishes comply with the company's needs they are provided. Particularly encouraged are courses and training in foreign languages, welding and CNC technologies. Further vocational education is encouraged if it complies with the company's requirements. Experience has shown that workers are not willing to attend organised additional training. Mostly, informal training is performed, the older workers passing their knowledge and experience on the younger workers. For this reason, the company has decided for the 'carousel' training

scheme – the worker learns the work tasks in a particular sector or in a particular team for a specific time and then he is re-located to another sector or team.

Particularly encouraged by the company is training for work tasks on CNC machines since these machines are of strategic importance for the company.

### **Investment in education and training**

The company supports continuous education of workers and gives financial support, provided the chosen study programme is in accordance with the company's requirements.

The workers with the vocational secondary education (welders) have opportunity to continue their education to attain technical secondary education of a mechanical technician. After completing their education these workers usually remain on the same workplace in the company.

The workers with the technical secondary education of a mechanical technician can continue their education in order to achieve the education level of a mechanical engineer or graduate engineer. At the moment 7 workers in the company are attending the programme of mechanical technician and two workers are studying for mechanical engineers.

### **Qualification of semi-skilled and unskilled workers**

Since the company has no specific education and training scheme, the employees are encouraged to attain certain courses (foreign languages, information technology) in the local educational institutions.

The 'carousel' training scheme provides transfer of knowledge and skills among the workers. Older workers pass on their experience on the younger workers.

The company provides and supports training of workers for operating large CNC machines. For this training they choose the worker who has excelled in his work performance. The worker is then appointed a tutor trainer. At the beginning the worker performs simple tasks and is gradually introduced to more complex operations. The training lasts approximately two years.

The company also provides training for apprentices. It has a qualified tutor for vocational schools pupil do practical training in the company in frame and time of their formal education.

## **Company 3**

### **Framework data of the company**

The company in this report has a 60-year tradition in the field of manufacture of water turbines, equipment for hydroelectric power stations and pumping stations, as well as hydraulic presses and industrial and forming equipment (e.g. cylindrical and bevel-gear drives and cranes and die-casting machines). The roots of the company go back to the business-industrial system which disintegrated in 1991. In the time of its existence the system was one of the biggest and most modern industrial enterprises in the former Yugoslavia. Its business field was die-casting and manufacture of turbines for hydroelectric power stations. In co-operation its strategic partners the enterprise provided equipment for many hydroelectric power stations in former Yugoslavia and worldwide. As a part of the company, Industrial school of Metallurgy was established, today an independent school in the network of Slovenian public vocational schools.

In 2004 the company became a part of the parent corporation, which consists of 25 dependent companies in eight countries. The company at present employs 440 staff (parent company total 7000<sup>19</sup> employees).

Activities of the company range from design to manufacture, installation and putting into operation, to servicing. All products and engineering solutions are the result of their own development. Most prominent customers of the company are large public or private companies for production and sale of electric energy. Main projects are acquired at international public calls. Their equipment is exported to over 50 countries worldwide. Most projects are in the countries of former Yugoslavia.

The company is a project-oriented organisation. Business functions of the company are managed through the modern information system (ERP). They have been awarded a QA System Certified according to ISO 9001. For innovation of product technologies and creation of technical documentation they apply CAD/CAM/CAPP computer systems. The company owns 12.000 m<sup>2</sup> of heavy duty machining and machining shop, 5.000 m<sup>2</sup> of welding shop and 4.000 m<sup>2</sup> of assembly shop.

### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

The company faces shortage of skilled workers, particularly middle-aged workers who could introduce young workers into work tasks and pass their experience. Company's products are of large dimensions which require large production plants

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<sup>19</sup> This company and company 1 are members of the same association.

and large machines. The company faces problems with fluctuation of work force, particularly in the segment of production. Young workers who have grown up in the age of information technology find it very difficult to adapt to the work in industrial environment. They are leaving the company because they are not able to merge in the social and work environment. Large machines are usually operated by two or more workers in work shifts. This requires communication which can present a problem between the young and the older workers.

The company employs experts of mechanics, metallurgy and economy. Predominant are skilled workers with the 3-year vocational education (turners, metal finishers, locksmiths), followed by workers with the 4-year vocational education (mechanical technicians, CNC operators).

In recent years the company has faced shortage of CNC operators. Knowledge of CNC technologies was included in the curriculum of vocational school of mechanics during the last education and training reform in Slovenia. The problem remains in the fact that pupils train on school models of CNC machines which does not suffice for immediate work in a company.

For work on CNC machines workers with the 3-year or 4-year vocational education of mechanical engineering are employed, work experience is preferred but they also train workers without vocational education. For work on classical machines workers with the 2-year or 3-year vocational education of mechanical engineering are employed, work experience is preferred but they also train workers without vocational education.

For work in development departments they look for employees with vocational education in the field of mechanical engineering (mechanical engineer or graduate mechanical engineer). Employees in development are content with work conditions since they work with modern computer programmes.

In the future knowledge of foreign languages (English), computer skills and willingness for further education will be important, apart from basic professional competencies. All the workers had to pass computer courses since all information are conveyed in electronic form. Workers have to be able to read work instructions, write reports and check technical documentation. Many employees deal directly with customers, therefore they had to attain fluency in foreign languages, particularly in English.

Skills that have much gained on importance are team-work, cooperation among employees and customers, work shift change process and quality awareness. Almost all new machines and measurement systems are computer operated which requires qualified workers.

Also, systematic knowledge transfer among workers will still be highly required, particularly from older to younger workers. The company's strategy will support

education and training in the field of CNC technologies, welding and thermal metal treating.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Further development of employees**

The company provides continuous education and training of its workers. For sake of rationalisation it cooperates with the parent company which manages the education policy for all the companies of the group.

Annual interviews have been common practice for years. Experience showed it to be a good opportunity for improving work conditions, mutual understanding and cooperation.

Development education plan for employees is created on basis of annual interviews of all employees. According to these interviews activities are determined and realised through training and education, or with re-locating workers similar work places, horizontally or vertically.

Human Resources Department set up education plan annually. They provide seminars in the company as well as further education.

Special attention is paid to recruiting and training of CNC operators. For this they train workers who have excelled in their work and have been with the company for at least two years. Training under mentors' guidance takes from 6 to 9 months.

### **Investment in education and training**

Investment in education and training is carried out in accordance with the annual education plan. Computer courses, foreign language courses and strategies of team work are carried out by facilitators outside the company.

The company encourages further education. In 2006, 26 employees attained formal education. Four of them became MSc and one Ph.D.

The company encourages cooperation of education institutions and enterprises in order to qualify highly qualified workers.

The company has a very good experience with workers, who after the three-year vocational school decide to further their education out of work, which takes two years. Their practical experience is upgraded with professional knowledge and they learn about modern technologies. After completing the education these workers generally remain in their workplaces.

### **Qualification of semi-skilled and unskilled workers**

In case of not finding appropriate candidates for certain work places, they employ workers of other profiles and train them. For strategically important work tasks they organise in-firm training for their own workers, who they already know and who are committed to the company. For certain profiles (e.g. welders) where there is shortage of skilled workers in the domestic labour market they often recruit foreign workers through the job agencies.

In-firm training also includes specialized trainings for professional improvement. Last year they carried out following education and training programmes:

- Computer based construction
- Water Turbines Course
- Health and Occupation Safety
- Hydraulics
- Ultrasonic testing

Fourteen workers attained welding certificate. The company also provides training places for apprentices of vocational schools of metallurgy, particularly for metal finishers, welders and CNC operators.

## **Good Practice Examples Wales (UK)**

### **Company 1**

#### **Framework data of the company**

The company is the largest producer of steel reinforcement products in the United Kingdom and one of the largest manufacturers of other steel long products. The facilities in Cardiff consist of a Melt Shop and two production facilities: one for reinforcing bar and wire rod and one for merchant bar<sup>20</sup> and light sections. In total, around 900,000 Tonnes of finished product are produced and delivered, mostly in to the UK market, each year.

The Cardiff based company, directly employs over 450 staff and several hundred sub-contractors in the locality and uses the most up-to-date steel making and rolling technology for the manufacture of its products. From the scrap steel feedstock to the final product, the company's knowledge of steel processing, combined with state-of-the art control, ensure they produce products of reliable, consistent quality at all times.

The employment structure reflects a combined workforce of approximately 900 people that includes those directly employed by the company (+450 employees) and Contractors (400 employees) employed under sub-contracting agreements. Working in areas from design to manufacture, the range of employee skills required by the company, are highly specialised. They range from using the latest technology in steel production with an investment of over £200 million since 2003. £150 million (220 million Euros) has been invested in new equipment and tooling and approximately £50 million (73 million Euros) in training and manpower.

The business field are in the manufacture of hot rolled, ribbed steel bar, for use in the reinforcement of concrete, reinforcing steel bar, wire rod for reinforcement, hot rolled flats and channel beams. Since the company produces large amounts of steel in various forms customers tend to be involved in the distribution to local manufacturing and structural companies.

#### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

Human resources employ workers of British Nationality at the present time and recruit mainly by newspaper advertising, web sites and employment agencies.

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<sup>20</sup> Merchant bar is a product range.

However, because the parent company is Spanish, there is movement between the Groups plants for a number of employees.

The company has a large workforce and constantly strive to ensure levels of skill of employees are maintained. Whilst it is appreciated there are difficulties in ensuring an appropriate skills base exists nationally the strategies which are in place are able to maintain a steady influx of appropriate skilled people into the organisation<sup>21</sup>.

Lack of experience or staff being recently recruited is the most common problem the company has to address. As a large organisation recruiting individuals with the right skills does pose problems in the recruitment of skilled staff, especially at the higher levels. Changes within the qualification profiles and fields indicate the need for qualified Electricians and Engineering Technicians is a problem and difficult to remedy in the short term, but is being addressed in part by employing more apprentices in these specific disciplines. In order to develop the workforce for their specific company needs; the company has employed more apprentices.

What is more important to the company is to create an environment where employees stay within the organisation retaining and passing on their specialist skills. It appeared lack of skills applied predominately with new recruits which is to be expected, hence the company's heavy investment in the Modern Apprenticeship system.

Hence, the company's strategy to overcome skill shortages is to invest heavily and train their own staff from apprentice to technician, developing skills, which are important to the company's future development.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

### **Modern Apprenticeship Programme**

In order to tackle skills shortages the company invests heavily in apprentice training and follow a traditional four-year scheme of Vocational Education and Training (VET) programmes within the Further Educational system.

Initially the apprentice follows a National Certificate in Engineering as a 'Technical Certificate' and National Vocational Qualifications (NVQ) at Level 2 and Level 3 which is achieved through a mixture of 'off the job' training at a FE College and also, within the workplace. The apprentices will also study a Higher National Certificate in an appropriate qualification route under the Higher Education system.

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<sup>21</sup> Company strategies for recruitment are able to provide the skilled labour the company require.

## **Knowledge Management**

Knowledge Management is a key function of in-firm training, which addresses skill gaps within the company, apprentices' work closely with a range of skilled personnel to ensure skills are taught and passed on. The company prides itself in its flexibility, with the majority of employees being skilled in a range of engineering processes and techniques learnt this way.

## **'Carousel' Training**

The company operates a 'Carousel' approach to the apprentice training where an apprentice works in a particular sector for a specified length of time before being re-located to another sector to learn the processes involved. This will continue throughout the duration of the apprenticeship.

## **Training at all qualification levels and facilitating Continual Professional Development (CPD)<sup>22</sup>**

The range of employee qualification and skills range from Production Operatives at Level 2, to Post-graduate Engineers at Level 5 in a wide range of disciplines as would be expected of a high volume heavy industrial environment of this size.

Further company training extends to CPD, for those staff that would like to enhance their skills through a range of vocational training courses and bespoke specialist training.

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<sup>22</sup> This is a term describing the individuals own training aims and objectives. This could range from an in-house training course e.g. Health and Safety to level 4 qualifications (degrees etc).

## **Company 2**

### **Framework data of the company**

Company 2 operates from a purpose built facility located in the heart of Cardiff. The company has considerable experience in design and manufacture of a wide range of equipment ranging from complete 'Turn-Key' projects, including process refurbishment and upgrading mechanically and electrically existing equipment, to fabrication and matching of such components and batch work.

The company specialises in fabrication, machining and assembly of single items and complete assemblies up to 20 tons in weight. The company has made substantial investment in modern machine tools including CNC Milling and Boring machines. To realise the investment in machinery and their labour force skills the company has achieved BSI to EN ISO 9001.

The company's business fields are in areas relating to repair, overhaul and refurbishment of a wide range of engineering components. The range of employee skills required by the company is highly specialised. They range from using the latest technology Computer Aided Manufacture (CAM), machining component parts, Assembly and Welding. Main areas of production include a Machine shop, Fitting shop, and Fabrication shop.

Their customer markets include Steel Works, Power Stations, Paper and Chemical industries. An important part of their service is the installation and repair of gearboxes for heavy industry usually at the customer's works.

At the present time it employs 40 production staff in a range of machining and maintenance roles. Skilled workers are also sub-contracted for work at a nearby steel working facility. The administrative section employs 12 staff, human resources 3 staff and sales 4 staff.

### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

Employee qualifications, technical knowledge and experience are valued highly in its employees. Skills such as gear cutting are needed and initiatives are in place to up-skill and develop staff through knowledge management activities. This is in order to provide an efficient response to customer requirements in this important part of the business. Many of the skilled workers within the company are approaching retirement age and there will be an acute shortage in the areas of experienced machinists over the next five years.

The majority of the workforce is time served and regarded as highly skilled individuals equating to level 3 technicians.

All new employees undergo an induction on Health and Safety (H&S) as part of the in-firm training policy when they start employment. Although, in general employee training appears to be reactive in the sense the company train 'in-house' when the need arises to develop and enhance employees skills in particular areas.

The existing workforce has many years of experience in traditional processes, but there is a danger that the company will lose its skills match because of the age profile of the skilled workers. This has led to the altering of the qualification strategy and an investment in apprenticeships to train younger people with experienced workers in order to pass on the high skills that are specific to their sector of business.

Human resources have tried to recruit skilled workers but the skills required are not apparent in the marketplace. The problem appears to have emerged when local engineering companies having closed over the years in the area and the skilled workers have decided on another occupational route.

Many of the workers who have shown an interest in developing their skills further have been given the opportunity and 'on the job' training to bring them up to the skill levels required but this hasn't included formal training.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

The company employs three main strategies to address skills shortages and gaps identified and are based around the following:

### **Modern Apprenticeship Programme**

The company's qualification strategy is to employ apprentices and will link with students who are already attending an FE course in Engineering. They feel this is important because that young person has already shown an interest in the sector. The college is in a position to be able to recommend prospective apprentices to them, as it provides the company with individuals who have already developed basic skills in engineering that can be developed further within the company.

There is a commitment to develop its workforce to be flexible<sup>23</sup> in enhancing and broadening their skills base in order to be responsive to customer requirements, which the company prides itself in being able to achieve.

The National Qualification Framework (NQF) at the present time appears to satisfy the company's general training requirements for its trainees. It provides the basic

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<sup>23</sup> Flexible in this context means the individual is capable of performing many tasks within the organisation.

foundation to enable the company to train 'on the job' enhancing trainees skills applicable to the company's business fields.

### **Continued Professional development**

Further training within the company is based upon Continual Professional Development (CPD) and exists only in part when employees show an interest in their own development and meets the needs of the company, who will pay course fees for staff attending programmes of study by evening. The courses followed range from Computer Aided Drafting (CAD), Computer Numerical Control (CNC) and even higher degrees in Business Management.

### **Knowledge management**

Knowledge management plays a significant part in company's transference of knowledge between older experienced staff and younger less experienced staff. Now the company is beginning to implement a more comprehensive apprenticeship programme, which will ensure specialist skills within the company do not disappear.

Hence, the company's main strategies to overcome identified skills shortages is to train their own staff from apprentice to craftsperson, developing skills which are important to the company's future development.

## **Company 3**

### **Framework data of the company**

As the British arm of the Soehner Group of Companies company 3 was established in 1993, and are part of a major organisation with proven history as an automotive supplier to a worldwide customer base.

The Company employs approximately 230 people and is located in Tonyrefail, in the Rhondda Valley and manufacture high precision technical thermoplastic injection mouldings, and in particular, specialising in the manufacture and overmoulding of metal inserts for the automotive sector. This technology produces parts of both metal and plastic in which they are able to integrate a variety of electrical, structural and mechanical features forming the company's unique selling position.

The company's employment structure is made up of approximately 10% administrative workers 90% production personnel. The percentage of skilled workers and operatives equate to 50% categorized at a level 2 all other skilled workers equate to level 3 and level 4 skills. The future prediction is that skill levels will grow at the higher levels due to the increased levels of automation and innovation involved in the production process.

The company's business fields are very diverse, spanning a range of industries like Automotive, Domestic Appliance, Sanitation, Medical, Electronics, Communications and Electrical Engineering both at National and International level.

### **Situation and problems in terms of the shortage of skilled workers**

**(What are the problem areas faced by the company, where and how is the shortage of skilled workers apparent?)**

#### **Recruitment difficulties and skill gaps within the existing workforce**

The company is respected within the area in which it resides and therefore considered as being a good employer in regard to wages and working conditions. Therefore, recruitment problems appear not be an important issue since the company has very effective strategies in place to internally address lack of skilled workers and skill gaps within the existing workforce.

As with most large companies every effort is made in a planned and well-managed way to make good use of the skills employees already have and in developing and up-skilling existing staff by a variety of strategies.

Many prospective employees respond to vacancies, which have been passed to them by 'word and mouth', which supports the company's good reputation it has established in the area. 'Headhunting' is also employed when specific individuals are

identified as having the right type of skill and experience the company would benefit from.

## **Approaches for measures/ initiatives to reduce/ to avoid the shortage of skilled workers on shop-floor level**

The qualification structure of the company and strategies addresses the shortages of skilled workers and skills gaps.

### **Modern Apprenticeships**

A small number of apprentices are recruited each year to ensure a steady influx of appropriately qualified people are fed into the production system.

The apprentices attend FE on a part time basis studying level 2 NVQ and a C&Gs Craft Qualification, ensuring the apprentices combine work based knowledge development in the company with formal practically based qualifications obtained in the FE system.

This model is firmly embedded within the development of young trainees on a national level who are able to progress from NVQ level 2 to a NVQ level 3 qualification which generally equates to technician status. This strategy ensures the company is always developing employees with the right practical skills required to address production needs.

### **Succession Management<sup>24</sup>**

A deliberate and systematic effort is made by the company to encourage individual advancement and ensure continuity in key positions, including management, technical and specialist roles through a succession management approach.

The company qualification strategy places emphasis on National Vocational Qualifications (NVQs) together with Technical Vocational Qualifications from City & Guilds, BTEC and Higher Education. They will support training for all employees who show interest in improving their competence and developing new skills if beneficial to the company. Training positions are offered to Mechanical Engineering students and to provide positions to apprentices as commercial trainees, mechatronical engineers, technical draftsmen, molding technicians and precision toolmakers.

This is a key part of the strategy for succession management to assure skills are developed and grown from within the company infrastructure. The company places apprenticeships at the core of their succession management for skilled workers.

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<sup>24</sup> This term describes a policy of promoting existing employees to higher positions from within the organisation.

## **Knowledge Management**

Skills gaps on the other hand are addressed in-house in the traditional way of up-skilling individuals to learn skills and processes that are in danger of becoming redundant if the company isn't proactive in identifying the need and acting on it. This knowledge management approach is seen as a very traditional method many use of developing the skills of the workforce and has always been used.

Through 'Knowledge Management', experiences in the manufacture of high tech products are passed on to trainees and others within the workforce who require 'up-skilling'. There has been an increase in the need for this as new products and processes have been developed with heavy investment in ICT and Control Engineering that has resulted in new employees needs in those aspects of the processes.

This has brought about the need for developing mechatronic project engineers due to the automated nature of the production process that interface between computer processes and production techniques. To overcome this particular skill gap the company has identified key staff that have shown an interest in developing themselves in this respect of the business and will fully support the further training needs of the person.

All employees are responsible for the quality of the products and services, which customers receive. For this reason, the personal and professional development of staff is of critical importance. Technical expertise is placed high on the agenda when recruiting skilled workers.

## **Performance Management Appraisal System**

Performance appraisals are essential for the company to effectively manage and evaluate staff training needs, since they develop the individual, improve organisational performance, and feed into business planning.

Employee appraisals are generally conducted annually for each staff member who is appraised by his or her line manager. The process enables the management to monitor standards, establish individual training requirements and enable organisational training needs analysis and planning.

The company follows this strategy in order to improve and ensure retention and skills gap issues are addressed whilst at the same time improving staff motivation, attitude and behavior development. Performance appraisals are seen as being essential for career and succession planning which the company subscribes to in developing their strategy of addressing retention and skills gaps by specifically targeting individual employee needs.