

TECHNOLOGY – METALWORK AND MACHINERY – SECONDARY EDUCATION**CEF PROFESSIONAL PROFILE*****TARGET PROFESSION***

<i>Field</i>	Technology
<i>Education/Program</i>	Vocational Qualification in Metalwork and Machinery Level 3 of the EC classification, Upper secondary level, ISCED 3
<i>Specialization(s)</i>	Study programmes in - Manufacturing Technology - Automation Technology and Maintenance
<i>Degree/Qualification</i>	Mechanical Fitter Automation Assembler
<i>Language</i>	English
<i>Drawn up by</i>	Leena Hämäläinen
<i>Date/ City and country/ Organization</i>	February – May, 2006 Tampere, Finland Tampere College

<p><i>Methods used for collecting the information (methods, persons, dates)</i></p>	<p>Interviews:</p> <p>Mr A, engineer, senior lecturer in Automation Engineering in Tampere College; work experience in the field and as a teachers, total number of years appr. 30; the most recent in-service training period in the field in 2005</p> <p>Mr B, engineer, senior lecturer in Automation Engineering in Tampere College; work experience in the field and as a teachers, total number of years appr. 30; has developed teaching equipment and material for the field with Mr A</p> <p>Mr C, engineer, a teacher in Automation Engineering in Tampere College; born and studied in Germany, worked for several years for Siemens in managerial position</p> <p>Mr D, mechanical fitter, has worked for the same company, now known as Kalmar Industries, since 1978; worked in all continents, except South-America, for 20 years; the appr. length of a secondment is 2 months; interviewed on May 18, 2006</p> <p>Written reports by four students on a 4-week work practice in Denmark (Danfoss), February 2006</p> <p>Certificate supplement provided by the National Board of Education</p>
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B. OCCUPATIONAL INFORMATION

<p><i>Typical examples of professions/occupations/ Jobs</i></p>	<p>Fitter/assembler</p> <ul style="list-style-type: none"> - the interviewees pointed out that nowadays a division between electrical, mechanical, hydraulic or pneumatic fitters is rarely made; rather one should be able to cover most of the basic skills needed, hence as many sided education as possible <p>Maintenance man</p>
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<p><i>Typical organizations, companies, communities</i></p>	<p>Mechanical engineering industry: companies and workshops</p> <p>Companies developing and manufacturing equipment for different fields</p> <p>Importers of automated systems, hydraulic, pneumatic, electro-mechanical devices, e.g. storing and logistics systems for warehouses, cranes and other hoisting/lifting devices, and other harbour works, paper making machinery, power plant components, machinery for wind shield production lines, food processing etc</p> <p>Companies: for example Metso Minerals, Metso Automation, Fastems, Sandvik. Kalmar Industries, Tamglass, Smaller companies/workshops acting as subcontractors</p>
<p><i>Typical job descriptions</i></p>	<ul style="list-style-type: none"> - design and construct an automation system; - prepare logic programs and inspect and troubleshoot automation systems; - build bulk handling and repositioning structures and also operate and control bulk handling equipment; - install electric current sources and power supply units and perform simple control tasks related to the control of robots; - perform and interpret measurements related to maintenance management; - know the basic skills in electrical engineering, electronics and also in machining and welding; - operate, service and install mechanical, hydraulic, pneumatic and electrical automation systems; - build control systems appropriate for basic motor drive solutions; - install sensors and connect additional functions to a control system; - perform installation and assembly tasks and servicing and maintenance tasks; - master different manufacturing techniques used in metalwork and machinery; - prepare working plans; - have ability to do the finishing tasks, measurements and service inspections needed in machinery installation; - perform installation and sealing tasks of bearing applications as part of the assembly process;
	<ul style="list-style-type: none"> - assemble and disassemble different shaft-hub connections used in machine construction; - install shaft lockings and clutches; belt and chain drives; gear drives, gear trains and gear-head motors; - install electrical motors and lubricating equipment - use, service and install pneumatic and hydraulic actuators;

To what extent the language is needed

In most cases the official language of the importers is English, which means having the project papers in English. Manuals, brochures, technical details are mainly in English.

The interviewees pointed out that only in subcontracting you might get away with out English.

If seconded abroad, other languages are needed, e.g. if you are working abroad for 2-3 months, the conduct of other languages makes life easier and more comfortable especially in countries where French, Italian Spanish is spoken. The Far East and Arabic countries can also be challenging.

Earlier the import companies sent bigger teams for the job but nowadays only a very small team is sent over, and local people whose language skills might cause a challenge accompany the team.

Depending on the company, and the products, German is also preferred.

Basically, reading skills and oral skills, understanding and producing, are needed;

Tasks with a necessity to write English consist of filling in more or less standardized forms and documents; writing occasionally memos.

The written faxes/email messages concern usually shipments, delivery times or ordering new parts to replace lost or broken parts during shipping. Faxes or emails are preferred to phone calls because they also provide the project management with the necessary document. .

All the interviewees, including the students' feedback, stated that the most important 'skills', however, are courage, open-mindedness and cultural awareness, not forgetting the fact that while working overseas even for a short period, you are always representing, in other words marketing, your company, its products and your own country..

C. CONTEXT INFORMATION

	<i>LOCATION</i>	<i>PERSONS, COMMUNITIES, COMPANIES, INSTITUTIONS</i>	<i>COMMUNICATION SITUATIONS</i>	<i>TEXTS</i>
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<p>Work</p>	<p>Company's premises; Workshops and office areas, if e.g. the foreign client is present at a project meeting</p> <p>On work trips: - all the usual places (airport, hire hire, hotel, restaurant, bank, post office, shops, free time facilities, doctor's etc)</p> <p>- the places where the equipment is fitted (industrial areas, harbours, warehouses etc)</p>	<p>Co-workers and foremen; other project personnel,</p> <p>Authorities in some cases (customs, inspectors, work safety and quality control)</p> <p>In everyday situations as a customer (cf. locations)</p>	<p>Working environment (points a- c and f applicable also without an overseas secondment)</p> <p>reading and understanding information from reference materials such as manuals, instructions and project documentation which can be in English</p> <p>taking part as a team member in meetings with experts and clients while preparing for the installation/service/maintenance project; the language used depends on the language of the experts/client present</p> <p>communicating through email, faxes, phone with the client/local subcontractor on details</p> <p>bearing responsibility for getting the necessary permission, safety, security passes on clients premises</p> <p>teaching and guiding local team members to perform the installation, maintenance and service tasks, work safety and quality control, and, if requested, acting as their foreman</p> <p>preparing the necessary standardized documents, memos for the project management</p>

Study	<ul style="list-style-type: none"> - Classrooms and workshops at school - Compulsory and optional language courses; Scope of studies: <ul style="list-style-type: none"> - compulsory 2 credits/courses; - field specific compulsory studies up to the college - optional studies 0-4 credits/courses - part of the teaching material is in English; - possible exchange abroad and /or exchange students at school - Also possible visiting lectures and/or visitors 	<ul style="list-style-type: none"> Co-students Exchange students Language teachers Visiting lecturers and other visitor possibly In case of exchange/ work practice abroad, the local teachers, co-students, co-workers 	<ul style="list-style-type: none"> Reading study material (text books, manuals etc) in English Interaction in class Oral practice on situations in pairs, small groups, or individually Family relations, living conditions Drawing up applications for traineeship or student exchange Taking notes in class 	<ul style="list-style-type: none"> Manuals Description (show and tell –style) of procedures, processes, work orders Job advertisements Looking for a job through the Internet CV and application letter application Job interview Memo/minutes of a meeting
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THE MOST FREQUENT SITUATIONS

Situation 1: Taking part in a project meeting

Taking part in a project meeting where details on the product, customizing it, its installation on the client premises, timetables are discussed

Place: at the company premises before the delivery with a client's representative present

Persons present: project manager, people responsible for the technical plans, client/representation, fitter(s), support staff in Finland

What is essential for the communication to be successful?

- To be able follow, understand and take part in the discussion; in most cases the participants are using English as a foreign language hence the variants use different types of English, and also perhaps differing workshop 'slang'

Situation 2: following the written documentation of the project, writing a log on the process, preparing amendments if needed and agreed by all partners, communicating with the head office in such a manner and language that the documents can be attached to the files of the project

Place: on site abroad

Persons present: local staff and engineers and project coordinators in the home office (through emails)

What is essential for the communication to be successful?

- to be able to understand the written documents

to describe the needed adjustments and changes of the project plan in a foreign language even if they are to be done in an agreed format

THE MOST DEMANDING SITUATIONS

Situation 1: working in an international team abroad

Place: on the premises of the client (industrial location, warehouse, harbour etc)

Persons present: the seconded person/team and the local co-workers, management at home and present

Describe the phases of the situation from beginning to end.

1. Describing the different phases of the installation
2. Teaching and supporting the local co-workers during the phases
3. Monitoring the work safety and quality issues
4. Inspections of the device
5. Necessary documentation for the client, project management
6. Teaching the local operators and service/maintenance personnel

What makes the situation demanding?

- Interaction between people, including cultural aspects
- Courage to use a foreign language is vital (the terminology as such isn't problematic; you can manage in many situations if and when you can show what/how/when to do things)

Situation 2. Contacting local authorities

Persons involved: contacting the local authorities, suppliers by phone; in case of short shipments, breakage, adjustments

Place: on the premises of the client (industrial location, warehouse, harbour etc)

Describe the phases of the situation from beginning to end.

1. The components arrived late on the premises due and one piece of the shipment is missing; the customs documents show that the missing piece has arrived in the country; the fitter needs to contact the local haulage company/postal office by phone
2. the short shipment has to be duly noted in the project log (in writing) and the HQ back need to be informed
3. an agreement need to be reached whether to try to locate the missing piece, to wait for a new shipment, or to replace the missing part with a suitable one produced by the local companies; negotiations and written documentations needed

What makes the situation demanding?

- Talking on the phone with someone who speaks the language as a foreign language without being able to see the person
- The need for accuracy with component/part numbers, delivery conditions and dates, quality control

SNAPSHOT

Heikki arrives at his work place at about 6.30 am. He meets and greets his fellow workers in the locker room and changes into protective work clothes. Usually somebody of the early-birds has made a fresh pot of coffee. Heikki then enjoys a cup with his workmates and exchanges opinions of the ice hockey teams and their doings of the previous night.

The project team has its meeting, usually 2-3 times a week, during which they check the status of the project they are working on. The project manager is present as the project is nearing its final stage and the whole team feels the pressure of deadlines closing. This time a new crane and automatic bulk handling system is being assembled and will be shipped to Malaysia in due course. The project manager goes through some of the matters pending with Heikki who then continues with the tasks he's responsible for. At this point of the project, the parts are being packed for overseas shipment.

Heikki needs to make sure all the required paper work is up-to-date. The quality control system the company follows also requires systematic recording of the various stages of the project. These documents, mainly standardized forms, are in English.

Heikki will travel to Malaysia in due course and see to the assembly work there. He needs to contact the local client and give the details on the schedule and arrange also the local transportation of the machinery being shipped over. Heikki will be traveling with another team member, Pekka. This is Pekka's first overseas project so Heikki, on one hand, can share the work load with somebody, and on the other hand needs to act as a mentor to Pekka. They also need to hire some local people to work with them. Heikki and Pekka have been given the material, written by the personnel department, which they can use while tutoring the local people. They have to go through the material to check that everything needed is there and that they themselves know what the package consists of. The quality control standard the company follows is also very important.

Heikki has taken care of many overseas secondments. In fact, Heikki has been to Malaysia and worked in the vary harbour area some years ago on a different, minor project before. This has helped both the whole project team, and Pekka and Heikki of course, in the preparations. The company makes the arrangements for accommodation, but this time the guys have decided on renting a suitable apartment instead of staying in a hotel. The apartment will provide them with more space and peace and quiet in order to manage better the long and strenuous working days. During his lunch break Heikki emails the apartment rental firm confirming the date of their arrival. He has to wait for the confirmation until the following day due to the different time zones.

In the afternoon a component shipment from a subcontractor arrives. Heikki needs to check the details of that. While doing that he notices a short shipment: some sensors were missing. Heikki has to inform the project manager, make a note in the project log (in English), and contact the subcontractor,

who then checks their mailing lists and sends the missing parts express. The project manager calls Heikki before the day is over to see that the problem was solved.

The company insurance policy requires medical check-ups before overseas placements. So Heikki and Pekka both leave early today for that and booster tetanus shots. The nurse updates their international vaccination cards and hands them over reminding them also about the malaria medication