

9.6 DELIVERY AND SERVICE OF THE CNC MACHINE TOOL

The whole process does not finish by the design, manufacture and assembly of the machine tool in the manufacturing company. The machine must be then transported to the customer's company, it must be installed and it is necessary to provide its service. These seemingly easy processes must not be underestimated by the manufacturer of the machine tool because they can have harmful influences on the future relations with the customer.

Let us suppose that the machine was properly ordered, designed, manufactured and assembled in the manufacturing enterprise and it is prepared to be dispatched. Even if many other subsequent processes are mentioned in the commercial contract, this contract is really known by a small number of company employees. Some of them consider the other processes to be the second rate ones, because only their work is important according to their explanation. Sorry to say, these people are often the design engineers. All subsequent processes have the target to transport the machine safely to the destination place, to install it, to receive the agreed payment and to provide the customer the satisfied machine utilization.

Before the machine leaves the manufacturing enterprise

Fig. 9.6.1 shows the technical and economic finishing of the machine tool implementation process which is supported by the commercial contract. The machine must be packed by the manufacturing enterprise based on the determined transport way, while it is significantly favourable to make an agreement following

the international commercial conditions. Moreover, it is necessary to agree all payment and security tools related to the payment and financing of the machine tool delivery to the customer. These tool will be discussed hereinafter.

From the purely commercial point of view, the customer is that one who the manufacturing enterprise has concluded the commercial contract with. This term often denotes the final machine user having purchased the machine through the representative. Then, the customer is for the manufacturing company its representative in the particular territory providing often also the service activities. The representative is usually the commercial and technical company which represents the manufacturing company within the determined territory on the basis of the contract or of the agreement. Considering the exclusiveness, the representation can be the exclusive one or the non exclusive one, when more representatives can supply the customer. Regarding to the representation form, the representative can represent on his behalf and on his own account or based on the commission mediation [Kopp 2006].

After all requisites included in the commercial contract are fulfilled, it is possible to invoice the agreed amount to the customer. The invoice is the accounting and tax document which is the essential document for taxation record keeping and takings statement. The invoice must include all requisites conditioned by the accounting and taxation legislation. The invoice can be issued after the machine is handed over to the user and on the basis of transport documents (CMR, etc.).

Commercial contract

The commercial contract of the machine tool delivery is the essential commercial document describing who, whom, what, when and for what amount shall supply and how the thing will be supplied. The commercial contract has generally various oral and written forms and it must have the requisites given by the appropriate legal rules. The most often used forms of the commercial contract used at the machine tool deliveries are the contract of purchase or the contract for work. The conditions of payment are the integral part of the commercial contract. This is the agreement about the payment terms and conditions for the machine delivery. The following model is usually agreed [Kopp 2006]:

- the first advance payment bound to the contract signature;
- the second advance payment bound to the successful acceptance;
- the balance payment bound to the successful machine handover at the final user.

The payment tools concluded in the contract provide the payment or financing of the machine tool delivery. It is possible to distinguish two essential payment and at the same time security tools. The bank guarantee is the first one of them. The bank guarantee can be defined as the written bank declaration mentioned in the letter of guarantee that the bank will satisfy the creditor up to a certain financial amount in dependence on the contents of the letter of guarantee, if the third person does not fulfil a certain obligation and the entitled delivers the written declaration to the bank within the guarantee validity time, that the third person did not fulfil a certain obligation and this entitled asks the bank for fulfilment.

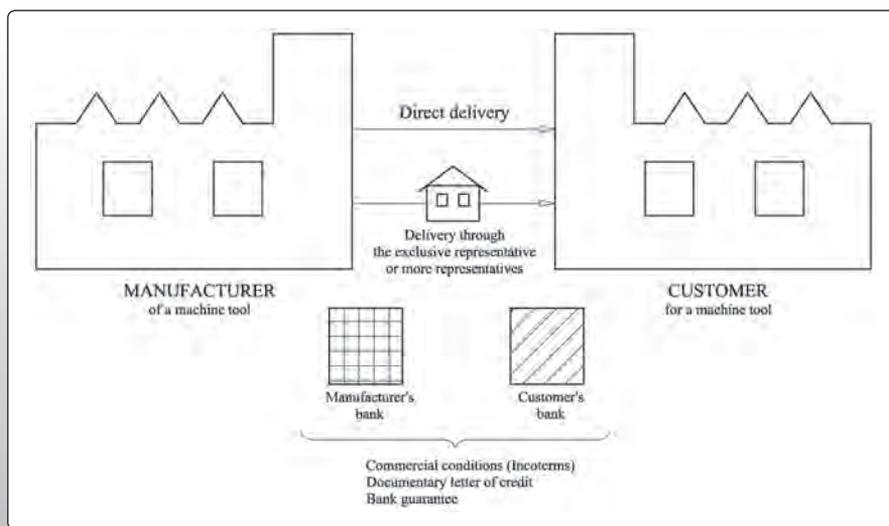


Fig. 9.6.1: Technical and economic finishing of the machine tool implementation process

The documentary letter of credit is the second tool and it can be defined as the written bank obligation to pay properly the determined amount or to do any fulfilment provided that the terms and conditions of the letter of credit are fulfilled, i. e. that the documents determined in the letter of credit have been properly submitted to the bank during the validity of the letter of credit. The basic types of the letters of credit are [Kopp 2006]:

- irrevocable letters of credit – the obligations following from the letter of credit cannot be changed, cancelled or withdrawn without the agreement of all participated parties, i. e. of the mandator, of the bank and of the entitled;
- revocable letters of credit – they are not very often in the international trade, they do not provide the sufficient certainty for the seller, they are suitable only for solvency partners with good experience. The change or the cancellation can be performed in the written form in relation to the entitled, until the conditions specified in the contract of letter of credit are fulfilled. When the document of letter of credit does not determine that the letter of credit is revocable, this is the irrevocable letter of credit by the law.

Another possible condition of payment is the so called smooth payment. This is the non documentary simple payment from one account to another account. The law basis is represented by the contract between the client and the bank about the payment execution. The payment will be performed unilaterally based on the payment order of the mandator towards its bank, charging its account and accounting with the bank subsequently which the payment is aimed at.

The term of delivery is another item which must be written in the commercial contract. This concerns the contractually bound terms and the machine delivery way in dependence on the conditions of delivery INCOTERMS 2010, usually conditioned by the acceptance in the manufacturing enterprise and the machine handover term conditioned by the acceptance at the customer or at the final user.

The contract penalties if the machine delivery term is not kept are also often included in the commercial contract. If all contract parties fulfil what was agreed,

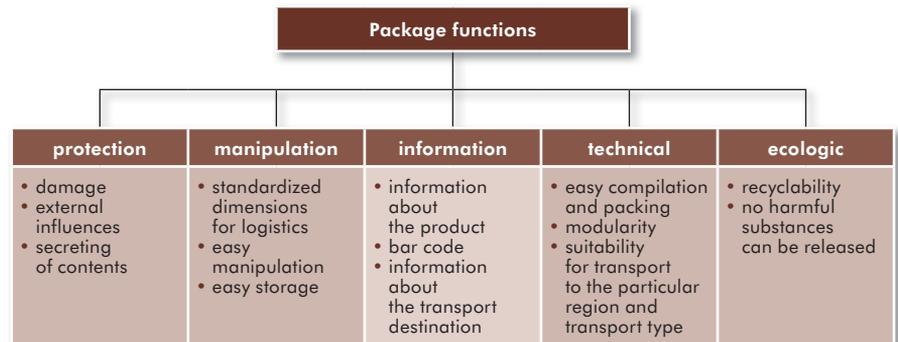


Fig. 9.6.2: Package functions

this is a formality. If they do not keep what was agreed, it always costs a lot of money [Kopp 2006].

International commercial conditions

Incoterms (International Commercial Terms) are the international commercial conditions valid for the transport of goods which manage payments for the transport, risks and obligations among the shipper, the purchaser and the seller. They are used in international commercial contracts. They were created by the International Commercial Chamber (ICC) and they determine the obligations of the contract parties at the delivery of goods (costs and risks). The practical utilization is that the contracts in the international commercial relations refer directly to the groups of Incoterms clauses. From the management aspect, Incoterms are the contractual commercial standard which is accepted by the governments, legal authorities and commercial societies all over the world. The first Incoterms version was presented by the International Commercial Chamber (ICC) already in 1936. The contractual Incoterms conditions have been updated six times since that year to keep the step with the international trade development [www-1].

Incoterms 2010 have four groups of legal clauses (group E, F, C and D). The most often used Incoterms clauses are [www-1]:

- EXW (Ex Works) – from the factory (agreed place);
- FOB (Free On Board) – freight charges paid on the ship (agreed shipment port);
- CIF (Cost, Insurance and Freight) – costs, insurance and freight costs (agreed destination port);

- DAP (Delivered at Place) – delivered on the destination place;
- CPT (Carriage Paid To) – transport is paid to (agreed destination place).

Transport type

Using the manipulation package, the machine tool is transported (supplied) to the customer or to the mediation chain (trade, representative in the particular territory). The packages should be made in such a way that their function (Fig. 9.6.2) can be acceptable for the supplier as well as for the customer.

The package must protect the machine tool against an accidental damage or against the damage at manipulation. The machine is often packed also to the covering plastic film impregnated by oil to prevent the impacts of atmospheric influences (humidity and heat), if the outside package may be damaged. When the package has the standardized dimensions, its transport will be facilitated. Standardization has the same influence on manipulation as well as on storage. The bar codes are located on the outside package and these bar codes carry information about the particular product. When the machine tool is packed at its manufacturer, it is important that the package shall be compiled easily and the product can be then packed easily.

The machines are supplied to still and still more distant regions and continents. Therefore, it is important to select the correct transport type. The transport is usually included in the acquisition price. The following transport types are used:

- road (car) transport;
- railway (train) transport;
- river and sea (ship) transport;
- aircraft transport.

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Transport type	Transport speed	Transport reliability	Transport repeatability	Availability in the Czech Republic	Transport universality
Road transport	middle	smaller	highest	highest	high
Railway transport	middle	middle	middle	middle	high
River transport	small	middle	small	smaller	middle
Sea transport	small	middle	small	small	middle
Aircraft transport	highest	highest	highest	middle	small

Tab. 9.6.1: Comparison of transport types

The comparison of these transport types can be seen in Tab. 9.6.1.

The mentioned criteria for the assessment of the particular transport types according to Tab. 9.6.1 must be understood as the general ones, because the particular cases are not taken into account. E. g. the railway or the road does not lead to the USA and therefore, only two transport types, the sea transport and the aircraft transport can be considered. The costs necessary for the single transport types are not mentioned intentionally. The costs change rapidly, in dependence on the price of fuel and oil or the political situation in the particular region. The single criteria from Tab. 9.6.1

have another importance e. g. for the manufacturer having its seat in Prague than e. g. for the manufacturer having its seat in Brno.

Machine service

After the machine is installed at the customer and after the successful machine handover, the machine will be put into warranty operation. The warranty time period and the guarantees following from it are agreed in the commercial contract and they are specific for every manufacturing enterprise. This concerns the bilateral relationship and therefore the manufacturer as well as the customer have

their share in the fact, whether the trouble free operation of the installed machine will be for a long time period. The customer influences the machine availability by the active approach to the machine especially in the preventive maintenance field (Section 9.7). On the other hand, the manufacturer influences the machine availability by the quality of the machine design, manufacture and assembly, by the utilization of the top quality subdeliveries and by the ability to provide the machine diagnostics (Section 3.8).

The claim is lodged by the customer if the machine has a failure or if its availability is not kept. The manufacturing enterprise must implement the warranty service at the machine. After the claim is received from the customer and the situation is assessed, the solution will be started by means of hotline, remote diagnostics (see Section 3.8). It is also possible to send a technician or send the necessary spare parts to the representative in the particular territory and the representative shall perform the intervention. Let us notice that the factual cooperation of the machine tool manufacturer as well as of the machine tool user is necessary here for the service intervention to be the successful one. The very skilled and experienced technicians and employees are always available on the service workplaces, because it is necessary to have a big set of knowledge and experience related to the operation of machine tools.

The remote diagnostics is a very efficient tool for a quick and generally efficient service intervention, when the manufacturing enterprise is connected directly with the control system of the installed machine (Fig. 9.6.3). When this is not a mechanical failure, the error is remedied quickly by means of this efficient tool. Otherwise, the direct departure is necessary. However, also in this case it is possible to utilize the

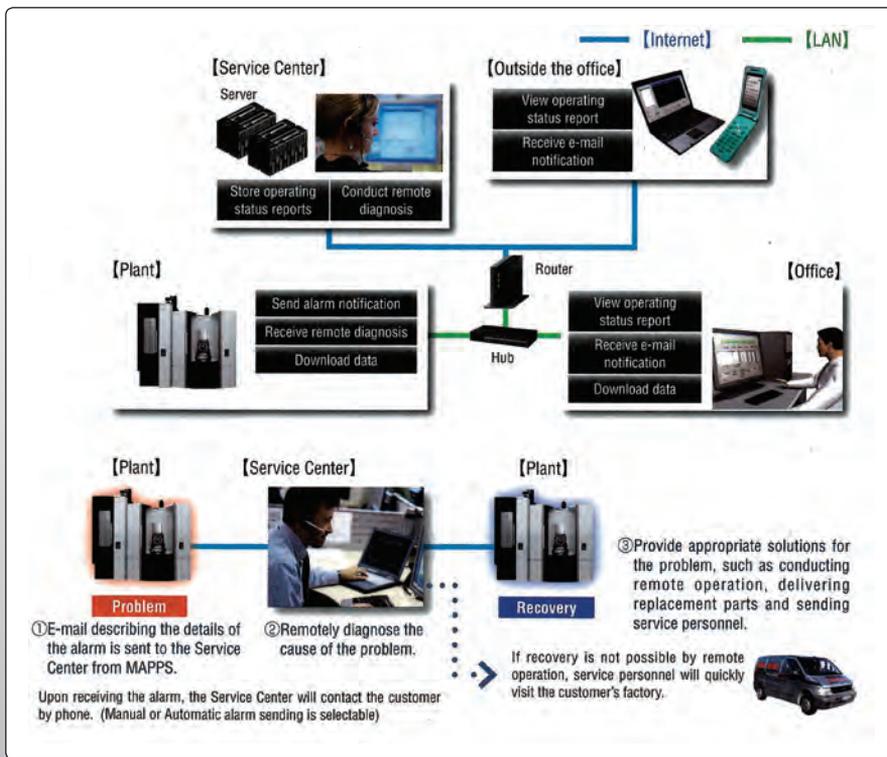


Fig. 9.6.3: Remote diagnostics Mori-Net [DMG Mori]