LOGISTIC TECHNOLOGY IN SUPPLIER- PURCHASER RELATIONS

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Abstract: The paper deals with a strategy of procurement synchronized with manufacturing. Deals with various supplier-purchaser relations, common inventory management and with use of modern logistic technology Just-In-Time in procurement. In the end the paper deals with legal aspects which need to be considered while negotiating agreements between supplier and purchaser applying procurement synchronized with manufacturing.

1 INTRODUCTION

The competitiveness of business closely related to its ability to respond quickly to customer demands. Rapid response capability depends largely on the supply business from external suppliers. Most companies pursued a strategy of sourcing from multiple suppliers, which is influenced by the relatively strong competition between suppliers and the resulting short-term benefits particularly in the price of purchased goods.

2 SUPPLY FROM MORE SUPPLIERS

One of the decisive criteria when selecting suppliers is the cost of purchased product, which is traditionally influenced by production costs of suppliers, the ratio between supply and demand and intensity of competition between suppliers. Strong competition in most cases, the reason for closing short supply - customer contracts. The management strategy of buying and supply has become a cornerstone of supply in many companies. Short-term contracts concluded in many cases in order to obtain immediate effect bargain, in terms of analysis easier than the long-term contracts.

In the predominance of supply and rising intensity of competitive bids, there is at suppliers' short-term reduction in prices of products offered. Often the price level is often below the required level of suppliers and of unfair competition, even below their average production costs. This process, however, has a long-term character and gives space to speculative buying. Long-term contractors can stay on the market only if they are able to realize in a given situation for a profit. It is clear that regardless of the short-term strategy of buying customers opt the final market price of long-term cost structure.

Supply undertaking from multiple vendors, closing short-term supplier-customer contracts and increasing competition among suppliers, usually associated with natural buyers trying to secure the production process of the business in terms of material, while taking advantage of benefits that are linked to changes market conditions in the environment. Persistence management to purchase this strategy is reflected in the realization of individual orders, material suppliers in small doses. In this way keeps the customer in the supplier's uncertainty and fears about the future.

Supply process can be implemented as needed or for taking stock. In the supply business as necessary required material taken immediately when it is connected to a specific contract. This avoids

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the costs associated with interest, storage and binding of funds. The disadvantage is the difficulty of planning and the possibility of additional costs in case of late delivery of material.

Taking inventory is an attempt to secure the necessary material, manufacturing process and prevent a possible halt production because of its scarcity. Inventories of production create independence
on suppliers esp. supplier relationships. Stocks allow withstand swings in market supply. Disadvantages associated with the acquisition of inventories are tying the funds in stocks, necessary in their storage and maintenance.

3 SUPPLY REQUIREMENTS BY PRODUCTION

The principle of supply as required in production is related to the development of the automotive industry to eliminate excess inventory components in the assembly plant. Growing demand, but also the competitive environment, placing ever greater demands on manufacturers and the automakers has no choice but to concentrate all their efforts on finding ever more sophisticated innovation at all stages of the life cycle of automobile production.

Supply required by the production company is usually based on non-standard relationships between supplier and customer and also based on long-term relationships and mutual trust, particularly in relation to quality and reliability of delivered products. For production of producing up to several hundreds of finished products per day to work flawlessly and smoothly, the logistics supply must work flawlessly - individual components or modules needed for production.

Efforts to minimize the inventory from the beginning were focused on direct delivery in volume quantities required components in accordance with the concluded long-term framework agreement. Direct delivery is refined in this case as to the number of required components through-offs, which differ from generally agreed upon minimum amount. The method of direct supply-driven offs requires flawless and flexible transfer of information between the customer and the customer. Information technology in logistics has an essential role in ensuring information flows and the possibility of taking the right decisions. Information management and business systems allow a relatively quick overview of suppliers, inventory status, and production in progress and in many other areas. In the field of logistics processes an information system is usually used on individual manufacturing operations to capture the movement of materials, preparations and products.

4 USE OF TECHNOLOGY IN LOGISTICS SUPPLY

In the transport links of production and consumption (supplying and consuming) cells logistics chains is very frequent deliveries of required components in the required amount of "just in time", i.e. the time when the needs of the customer, or the latest possible moment possible. Supplying article is adapted odebírajícímu article, which can be done by one of two possible strategies:

1st synchronization when the supplier produces and immediately (without storage) takes exactly the required amount in an agreed frequency, save storage costs, but its production of small amounts of more costly, will increase the costs associated with shipping to customers and transport distance can become a limiting factor

2nd emancipation, when the supplier produces greater benefits with lower production costs to meet customer's small size and high frequency supplies shipped through the warehouse - delivery in JIT mode is thus made up of the supplier's stock, however, he incurred the cost of storage and total logistics costs are higher

These options suit logistics technology known as Just-in-time. This is a management philosophy that aims to prevent any wastage of resources, time, and capacity and leads to minimize costs throughout the production process. Is considered as a waste of what adds value to the product. Elimination of waste is achieved by supplying the material at the right time at right place. A prerequisite is the perfect material flow in the required quantity, quality and deadlines. The purpose of JIT is to eliminate downtime and faster response to changes in customer needs and thereby increase competitiveness. This concept goes beyond the company and the right implementation includes the corporate area. The aim is "zero stock" and 100% quality. This goal, however, falls short of worry and abandonment costs

associated with supplies to contractors, but perfect cooperation and coordinated suppliers and customers. JIT technology has proven especially for those items that are used repeatedly.

Condition to handle JIT method is regular and thorough review of the basic elements of JIT, which are:

• High level of quality - poor quality causes disturbances smooth production flow. Small partial failure may result in high non-quality, so care must be taken at full quality from all suppliers. This minimizes disturbances have quality input into the production system. By creating a system of requirements for compliance and quality improvement will accelerate and ultimately also for cheaper.

• Smooth flow of production means that any activity in the production chain must be carefully coordinated to others. Production schedule (usually monthly) is used to create the plan purchase and production. It serves as a basis for creating daily production plans, which according to customers are further down for maintenance.

• Low inventories mean cost savings in production areas (intermediate storage).

• Small batch mean further reduction in binding nature of capital, reduce costs and increase flexibility. However, the increase demands on management.

• Quick and inexpensive adjustment - small batch and fast changing products in the manufacturing process require more frequent adjustment of machines. That would mean extra costs and we need to change the traditional way of organizing adjusting machines to work. It is good to promote the use of electronic, multi-adjusting devices, better organization of work setters, operators training alone machines, etc.

• Effective deployment of machines - traditionally in our manufacturing process is technologically organized. More applied question in arrangement, shortening distances between machines, shrink too large production facilities. The deployment of machines, equipment, products, people, etc., must serve today for smooth production flow. Shipping costs must be eliminated .Maximally it must conserve space, a modern plant is small and with several floors.

• Preventive maintenance and repair of machines - each accident means big delays. Subsequent costs
start-up production chains JIT is high. Therefore the probability of defaults is minimized. Responsible for preventative maintenance is moving to the service of the machines.

• machine coupling (qualification) - Traditional manufacturing is based on narrow specialized job production tasks. Especially for miller, turners, setters, maintenance workers, electricians, repairmen, etc. JIT philosophy prepares the operators of machines (operators) to handle all possible tasks and situations. This requires the development of creativity and broad manufacturing capabilities and knowledge.

• The spirit of cooperation - machine operators, managers and traders need to want reach together the objective.

• Less reliable suppliers - JIT prefers long-term bonds limited number of really reliable suppliers. Failure to immediate input means really high loss during the next manufacturing process.

• Pull system of manufacturing flow of goods - is to produce only what is subsequently sold. Optimal is what the customer ordered directly. Every workplace is indeed controlled by sale, demand.

• Creative decision-making system - creativity in production is necessary to concentrate on reaching and maintaining smooth production flow. JIT team promotes the prevention and management of chronic problems.

• Continuous improvement of production.

A key element of JIT methods is to reduce the complexity of products and production processes. To determine the suitability of components for JIT is most commonly used combined analysis of ABC-XYZ:

ABC analysis (Paret analysis) - assesses the items according to consumption (the amount of material flow) and sorts into the following groups:

A - core group - a small number of items with high usage (about 20% of the items, 80% of consumption)
B - mean number of average consumption +
C - a large number of items with low power consumption

XYZ - Classification according to turnover (rotation = annual sales / average inventory)

X - high stock rotation (much to sell, little refrain in stock)
Y - average stock rotation
Z - poor stock rotation

Just in Time method is suitable for the combination of AX - a small number of items with high consumption and high stock rotation.

Table 1 Classification of components suitable for application of JIT - ABC-XYZ analysis

Accuracy of response	Value		
	A	B	C
X	consumption of high value, high accuracy of prediction, continuous consumption	consumption of high value, high accuracy of prediction continuous consumption	low level of consumption high accuracy of prediction continuous consumption
Y	consumption of high value, middle accuracy of prediction, half-continuous consumption	consumption of high value, middle accuracy of prediction, half-continuous consumption	low level of consumption middle accuracy of prediction, half-continuous consumption
Z	High level of consumption, low accuracy of prediction stochastic consumption	Medium level of consumption, low accuracy of prediction stochastic consumption	Low level of consumption, low accuracy of prediction stochastic consumption

Involvement of employees is needed at all levels, because ultimately the success of JIT decides to approach each of them. It is also necessary to delegate extensive powers to production workers, especially with regard to the possibility of their immediate control of production. It is also necessary to ensure highly qualified and productive workers with the need to ensure flexibility of production, minimize unproductive time etc.

Prerequisite for the proper functioning of JIT is to ensure flexibility in production. Short-term manufacturing flexibility is the ability of the organism to adapt quickly to the changing needs within the

specified range. Long-term flexibility requires the means of production by adding new equipment, tools, equipment program, so that in good time the company was able to respond to changing customer needs. Information link of the supply chain is roofed computer systems, the physical connection represented by the transport network between businesses and operations, eventually handling system within the workshops. The information system can provide the information necessary to select the proper transport, packaging and distribution. His can be achieved through optimization. Creates a database that stores data and responsible person may at any time to find comprehensive information needed to ensure adequate movement of goods.

Also, the transition to standardized packaging and loading an auxiliary means with the possibility of combined transport systems can reduce time lost business, reduce the cost of packaging, containers can be used as a substitute for storage, automate the transshipment and reduce transport damage that may occur selecting an unsuitable packaging.

Mutual cooperation of suppliers and customers is important to ensure a high quality, technological level of products and reduce costs. The close relationship between them allows you to coordinate activities with the maximum degree of friendliness, which in turn can significantly impact the final effect.

4.1 Application of logistics technologies in the automotive industry

For production of producing up to several hundred cars a day to work flawlessly and smoothly, it must function perfectly and logistical supply of components or modules required for the production of these vehicles. Ensure this requirement is not easy. From the available sources, there is up to 50 thousand real mounting options. The customer has a possibility to configure the car when ordered according to their own wishes. In a wide range of colors, engines, interior equipment, and other options is virtually every vehicle on the assembly line unique. The idea that the car manufacturers themselves keeping inventory of modules and components for final assembly before the line is essentially utopian, and therefore most of them try to reduce inventories. Storage of such components would not only occupy an incredible amount of area that needs to be used for production purposes, but especially for the producers would represent a huge burden in the amount of money tied in inventory. The solution offers the concept of Just-In-Time. However, even JIT itself is not the answer to the need to supply the assembly line these types of parts whose specifications meet the specifications of a particular vehicle produced. For these cases applied the principle of supply automakers, known as Just-in-Sequence. In this case, the individual parts of the travel on the line exactly in the order in which they are installed in cars. In practice this means that the car vendor sends the production plan of each vehicle fitted with precise sequence requirements for vehicles and modules from suppliers. Suppliers under this plan, manufactures and supplies parts directly to assembly line exactly in the order of cars produced on the line.

The order of cars produced is determined during production scheduling, and suppliers will be sent approximately two days prior to the assembly in the form of sequential pulses, which define the order in which they need to add modules. Unfortunately for suppliers, producers such as Volkswagen and Skoda Auto, the order may not be definitive and can still be adjusted due to unexpected events that may occur during welding and painting. For example, a slight defect in body paint removal means of sequential order, and after the defect repair, the body is put back on line. Both cases imply a change in the order in which the cars assemble on the line. The final sequence in which the components needed to deliver and often goes to the supplier after the car starts from the paint shop. Now the supplier has a minimum time to order and assemble modules and components to match the final sequence produced vehicles, and to be dispatched in time to the assembly line. For the supplier, this approach presents high demands on the accuracy of deliveries, both over time and also with regard to the proper order of the supplied modules. So already, in some cases sufficient to dispatch the JIT sequence and must also assemble the final sequence assembly. It is true that in most cases the car sent to his forecast of production including the order of cars produced with two days in advance, but this plan, as already mentioned, is different from the final order and the suppliers have no choice but to be able to very flexibly and promptly respond to last minute . Any incorrect or late deliveries, which could for example lead to the suspension of production, automakers harshly punish considerable fines. Therefore, any potential error by the supplier must address a separate express delivery, which again raises uncomfortable unnecessary financial burden on business costs. Important role throughout this process also plays a reaching distance from the car suppliers. That in such cases

usually does not exceed the 50 km, because again there is a risk that the supplier was unable to meet the demanding time limits. In some cases, the supplier of the warehouse is located in the manufacturer's plant, where sequences components directly to assembly lines.

Lead time:

LT = TN + TV + TT [min]

where:

- T_N = time required for loading
- T_T = time required for transport (including reserves)
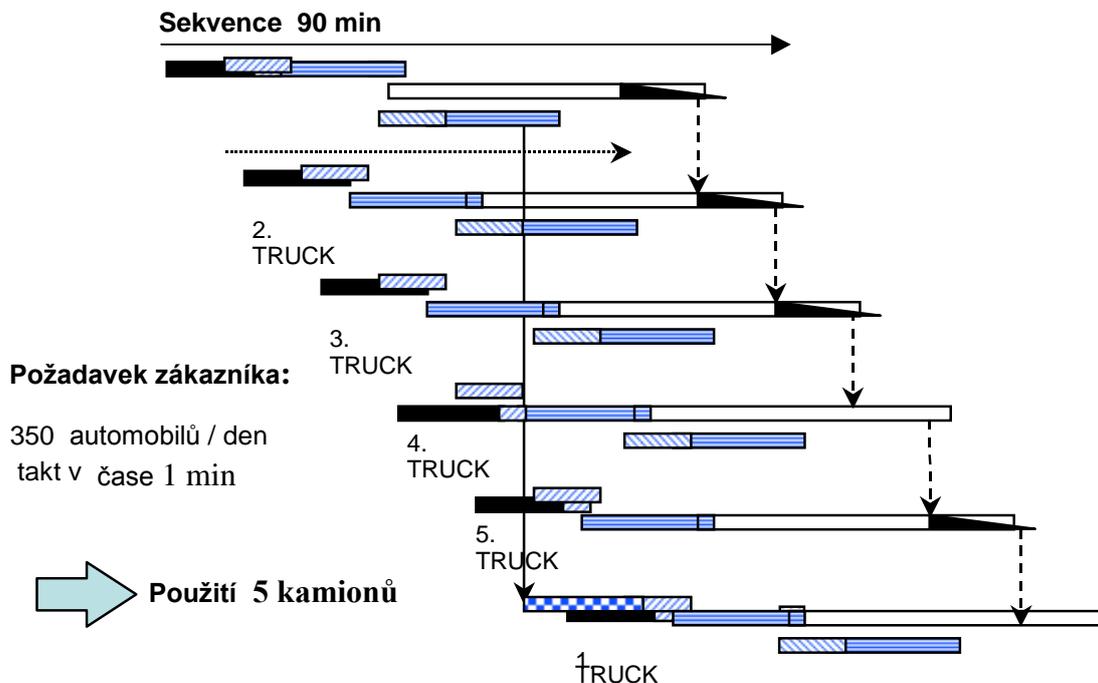- T_V = time required for unloading

Figure 1 The supply of production components in the system JIS 3

Currently, some automakers retreat from the harsh conditions under which it can supply only a limited number of suppliers able to provide sequential delivery. Not all vendors had fulfilled the conditions for such cooperation, whether because of increased driving distance, or availability of IT infrastructure. Plays an important role, of course, big financial demands of this method to ensure supplies for manufacturers, and therefore are increasingly starting to trend called "fixed", i.e. unchanging sequence. The whole process is based on the fact that car manufacturers (such as Ford, Jaguar BMW) sent to forecast sequence two or more days in advance and this has changed. outages or sudden changes in the paint shop, welding shop and engine shop, deals with self storage insurance stocks. Carmakers then when selecting the method of sequencing has inevitably compare the financial costs of both options, when on the one hand there is a growing supplier of financial requirements associated with the growing demands of security of supply and on the other hand, blocked the amount

of capital stock of emergency by the manufacturer himself. Go to the "fixed" in any event sequencing can significantly extend the range of suppliers with which automakers can establish cooperation in sequential mode. Due to the fact that the supplier receives the prediction of two or more days in advance, is able to effectively plan your own installation, preferably in the order which will then be dispatched, so do not hold stock of each model insured. At the same rule ceases to apply a short driving distance, as the orders of two or more days in advance no longer play such a role.

The concept of sequential JIS supply is a typical example of a process that implicitly stands for the IT system. Communication between the automaker and suppliers, and especially expedition sequence itself must be absolutely precise and flawless and is therefore trying to eliminate as much interference of human factor and the possible errors. However, this can only be provided using appropriate information technologies. Already own messaging - sequential pulses (reference data, forecasts sequence, the sequence itself) are done entirely electronically. Either through electronic data interchange (EDI) or in-house sequential suppliers disclosure of automakers. The contractor must have very high quality and reliable IT infrastructure solution that will be able to not only receive sequential pulses, but also to process and check for errors (duplicate sequence numbers, or lack sequence, accuracy items, etc.). You could say that even more important role performs a similar sequence control systems during production and subsequently during the expedition itself, which is about the whole process the most critical point. All parts must go because they precisely in the order in which they will be delivered to the assembly line and must be properly marked, always according to clearly defined requirements automakers. Each part is therefore necessary stick sequential label that describes the supplied component and defines what the car is determined. In cases where the supplier is forced to respond quickly to changing requirements of automakers, with sequential improvements automatically printed immediately upon receiving a pulse sequence so that the preparation was enough time. In the case of "fixed" sequence it is possible to print labels at the moment are starting to produce and assemble components for the car. Decides if the contractor fully synchronizes their production with the installation of automobile (the sequence of assembled cars), you can also use the information system the management of sequential assembly. Using the information system, because according to the received order (sequential pulses) directly generate a proposal (plan) delivery, which in turn will produce individual components and then placed in shipping containers. In addition to automatically generate and print schedule, defining All material items, which will produce a given part, or a list of the enclosed parts (not produced solely by the sequence supplied). Thanks to the on-line data collection, the Contractor is an overview of the current state of development and production, which can when compared with the current status and requirements of automakers. The expedition vendors via the information system uniquely identifies each unit (each sequence label), checks the correctness of manufactured components and the order in which they are arranged in a van. Automatically generate delivery notes and packing, which again sent electronically automobile. In addition, information technologies play an important role in mutual financial settlement between the parties. From the above it is clear that the sequential delivery of play in the modern automotive industry, an important role. According to AMR Research estimates its share at the expense of significantly increased standard supply. This study shows that already in 2010 rose JIS supply some car up to seventy percent, so that a large part of future vehicles will be assembled from components supplied in this mode.

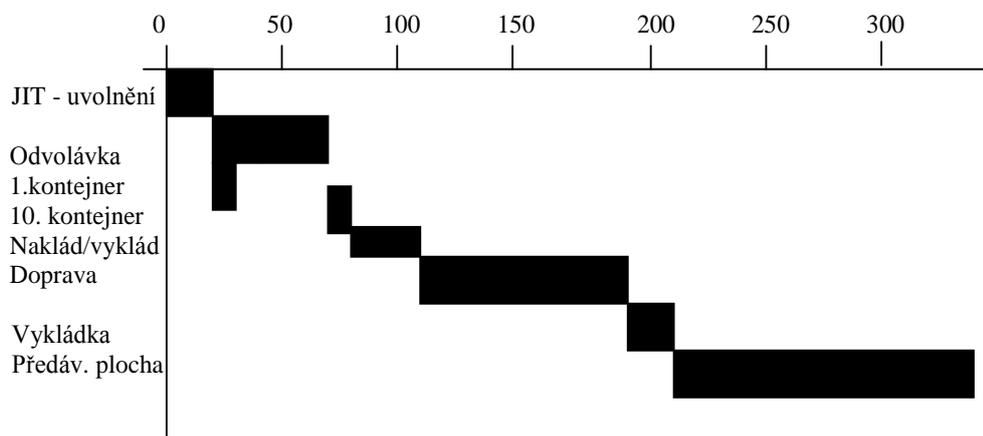| Model	Dodavatel	Název dílu	Řídící čas	JIT - kontejner			Počet kontejnerů	Vykládací místo VW	Stoh.
				1660	1200	1840			
Porsche Caynne	C&A	Přístr. deska	4,84	10			10	„D"	NE
		Střední konzola	5,26	10			10		NE

Figure 2 Diagram of the control time for VW Slovakia

4.2 The issue of road transport for the automotive industry

JIT transportation is available directly from the supplier of auto parts, without an external logistics service logistics provider (EDL), or are parts of a defined stock of generally three to five days stored in the logistics center. EDL then performs JIT services with all the responsibility for quality and timeliness of delivery.

In the first case where the supplier delivers directly go right parts to the customer, is the limiting factor for realization of this concept, its geographical distance from the customer and managing time for delivery to the assembly line. Distance from suppliers to customers for granting exceptions to this concept for some car manufacturers to 70 km. The risk, as the time delay, so too early application of sequencing is compensated by a larger stock of the buyer.

In the other case, i.e. the implementation of JIT logistics services through a supplier in its logistics center is not so risky. But despite intensive systemic support, planning time departures, loading, landings and last but not least, the infrastructure in place transport. It is necessary to offer clients an alternative route and replacement truck for transport in case of collapse, vehicle breakdown, etc. Response time for this emergency solution to the customer is usually defined only for a short 60 minutes. These are all aspects that have the organizational impact on the JIT-intensive transport. So it also contains binding specification.

5 LEGAL ASPECTS OF SUPPLY BY PRODUCTION REQUIREMENTS

The contract to supply synchronous with production is making accurate deliveries within specified timeframes and quantities ordered into production as well as security of supply of quality suppliers. Under such a contract should be strictly defined rules in the following points:

Material specifications and quality assurance

Material that is being supplied is exactly described. The contract may also be a drawing, confirmed by both parties. It is necessary to determine which tests to ensure the quality must be executed. Because of the direct delivery into production (no incoming inspection of goods at the customer) when defects are detected, usually requires only replacement delivery free of charge, but in addition and replacement costs, caused negative effects on the customer's production facilities;

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The involvement of suppliers and to source raw materials

For reasons of quality suppliers to outsource most of the nominal value used for the starting material, or are specifically associated with it determines the default supplier. The reasons in this regard may also consist of belonging to a group or in the mutual interests (compensation) stores. However, it is necessary to ensure that the contractor was able to translate their knowledge of relevant supply markets in the desired direction;

Forms and tools

Costs and ownership ratios in the forms and instruments must be precisely and unambiguously defined. If there is some form of protected type model must in any case remain in the ownership of the customer, to prevent abuse. It is necessary to define who bears the cost of care and maintenance of molds and tools. Scheduled time of the fitness is defined usually depending on the extent of yield;

Plan frontloading and delivery schedule

Planning systematically, it must also be contractually agreed upon terms of content and timing in the exact formulation. In this context, it should also provide for the demands on information obligations relating to the planned measures in the area of maintenance, which are associated with the occurrence of production downtime at some of the contracting parties. The supplier is obliged to inform on technical malfunctions that may affect the performance of supply;

The duration of the contract (notice)

In practice, contracts to supply synchronous with the production, which refers to special types of materials or components, usually undertaken for three years or longer periods, usually with notice to both parties is six months. In gross violation of contractual obligations must take immediate termination of the contract, for exceptional reasons;

Prices

Contract prices are typically fix a period of one year after its expiration may be set new. If the calculations transparent, can be included in the contract a clause on the use of moving prices, it is necessary however to avoid the typical shopping markets, because the resulting price for larger quantities supply is generally more favorable than in the published calculations;

Contractual penalties

If there is a lack of quality supply at the customer's production process is interrupted, damaged the right to charge as a penalty by replacement cost rates, previously agreed to agreed standards of work and time. Also, time delays subject to demands for payment of penalties;

Creation of information-technical assumptions

In order to ensure fast data transfer is necessary in the contract also stipulate that the technical equipment suppliers must be available;

Preservation of secret

If it is a requirement of secrecy already in normal supplier-customer agreements, it becomes an even greater importance in the preparation of contracts in the JIT system. To prevent direct leakage of know-how to client orders to competitors, it would be contracting with competitors of the supplier made dependent on agreement of the customer, or should generally be excluded;

General Conditions of Purchase

In situations that are not explicitly covered in the contract, subject to the general purchasing terms and conditions

6 CONCLUSIONS

The introduction of JIT and process control is extremely difficult. It must be the result of thoroughly thought-out action by all stakeholders of articles - from supplier through to carrier customers. Due to the lack of infrastructure is its deployment difficult in the Czech Republic. In particular, crowded roads and unreliable carriers cause many problems in the smooth running of JIT. In recent years, however, high competitiveness, huge impact has been on improving the quality of the

transporters. When implementing JIT is primarily necessary to consider what we expect from this technology what is suitable and whether other species.

For the application of JIT technology there are the most favorable conditions, where demand is stable and the subscriber has a dominant position over suppliers. The supplier must meet the demanding conditions, the activity must be consistent with the needs of the customer and its supply must be managed at a high level. However, this requires the operation flow of information between all partners involved. The most common mode of supply in Just in Time is used in the automotive industry.

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