

**MODELS OF ENGINEERING IN RESTAURANT BUSINESS**

**Hubar Tetiana,**

Student

**Kuzmin Oleg,**

Doctor of Technical Sciences, Professor

National University of Food Technologies

Kyiv, Ukraine

**Annotation.** The life cycle of creation of the restaurant industry facilities consists of four main processes: initiation, facility creation, operation, and disposal (reconstruction). The construction of a restaurant is one of the key stages of this cycle. Because from the faultlessly developed object, successfully selected materials for walls, floors, roof and properly conducted and installed necessary communications allows you use these objects to perform the necessary work safely and easily. A well-chosen contract by the investor allows to distribute the processes of creating an object, responsible for the risks and set the boundaries of the regulation of their relationship. This article provides an analytical overview of the models of division of responsibilities between the participants of construction projects depending on the type of contract.

**Keywords:** models of responsibility, engineering, *EPC* contract, *EPCM* contract, *EPCS* contract, *PMC* contract.

**Introduction.** There are four interrelated processes in the creation of a construction object [1–2]: *E* – engineering; *P* – procurement; *C* – construction; *PM* – project management.

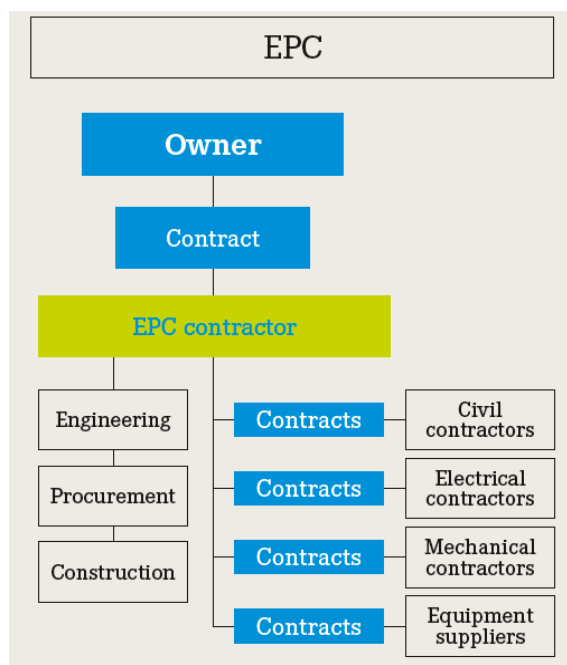
Given the existing practice, it can be argued that responsibility for these processes can be shared between the contractors (customer, contractor and consulting engineer (engineering company)) [3]. The distribution of these processes between the executors and the possibility of regulation of their relations depends on the conditions

signed by them. The types of contracts, which include comprehensive design, supply and construction are the most common. Among such contracts are usually distinguished: *EPC* contract, *EPCM* contract [4], *EPCS* contract, *PMC* contract [5].

**Actuality of theme.** Project management in *EPC* often encounters the problems [6] such as cost overrun [6, 7], schedule overrun [6-8], delay in material supply [7, 8] and loss of productivity [7]. Accurate cost estimation is essential for any *EPC* contractor accepting profitable projects because the project price is determined prior to receiving the contract [9]. To overcome these problems for achieving a sustainable *EPC* system, it is necessary to explore the underlying causes of these problems and study policies to tackle them [7].

**The aim of the work** is an analytical review of models of distribution of responsibilities between participants in construction projects depending on the type of contract.

**Results and discussion.** *EPC* contracts (Fig. 1) are on the way to become the most usual form of contracting applied by the private sector to undertake construction works on large scale infrastructure projects [10].



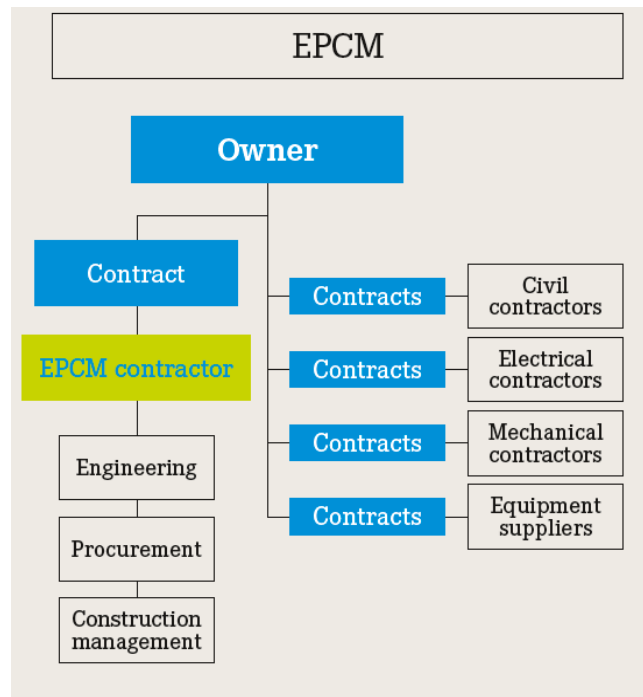
**Fig. 1. *EPC* contract strategies [12]**

The customer indicates certain technical aspects of the future facility, and the contractor assumes all responsibilities and risks for the design, supply and construction when they conclude *EPC* contract [11].

The design aspects performed by the contractor include basic engineering, detailed design, design, planning. The contractor usually provides logistics, transportation, invoicing, receiving materials when he purchases materials. The contractor carries out the direct construction of the facility, electrical installation, installation of ventilation systems, connection of water supply, plumbing and drainage works. This type of contract is often equated to a «turnkey» contract, but there is a difference between them, as the *EPC* contractor is not responsible for putting this facility into operation, as is the case with a «turnkey» contract.

The advantages of this type of contract for the customer are a fixed contract price and fixed terms of the project, the ability to set performance specifications and limited liability of the customer. However, the last advantage can sometimes be a disadvantage, because the investor should not be able to control the creation of this object. Another significant disadvantage of the contract may be its cost, as the delegation of all processes to the contractor is more expensive. This type of contract is usually concluded during the construction of facilities, when the most important aspects for the investor are productivity, fixed terms and price, and the aesthetics of the design do not play a significant role.

The *EPCM* contract (Fig. 2) is slightly different from the previous one, as the contractor is responsible for the design, procurement and management of the construction. The investor has more powers that allow him to participate in project management, when concluding this type of contract. He can reject or approve the choice of subcontractors, monitor their actions, make demands on their work. The control of the subcontractor by the customer allows to accelerate construction and in parallel to carry out works which are not connected with designing of ground works (earthworks, laying of the base). This type of contract is appropriate when the investor wants to have more authority to manage the project, or wants to build the facility as soon as possible.

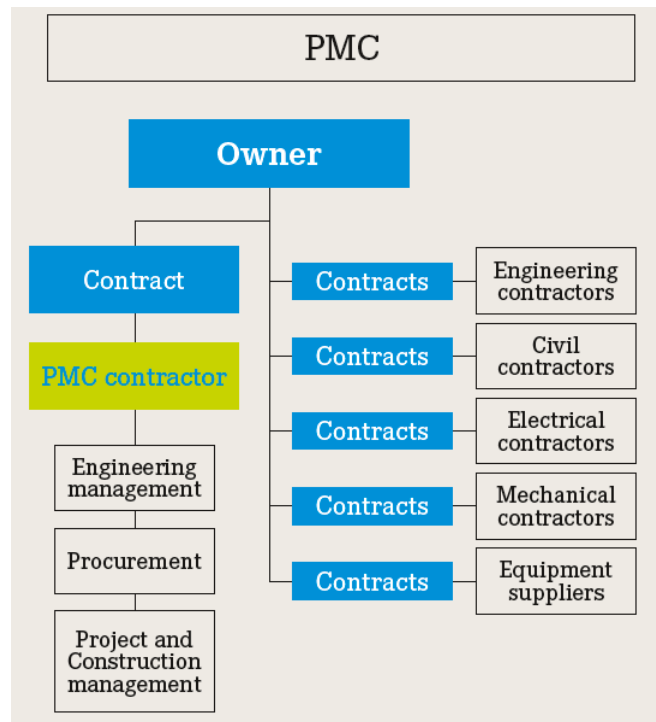


**Fig. 2. EPCM contract strategies [12]**

The contractor is responsible for the supply and management of the construction and performs pre-investment research, project documentation development, procurement and supply of equipment, quality control and technical supervision of the construction at the conclusion of the *EPCS* contract. These contracts are used by investors in cases where it is necessary to reduce the cost of design work, as separate implementation of processes is cheaper than their full delegation to one contractor. The lower cost of *EPCS* contracts is due to the reduced share of liability and risks of contractors.

There is also a type of *PMC* contract (Fig. 3) that involves the contractor providing only project management services at all stages. The contractor's responsibilities include: project planning, monitoring and control over its implementation, resolving force majeure situations that arise during the construction stages. The investor chooses this type of contract when it is necessary to delegate the function of managing the construction of the object.

**Conclusions.** So, there are different types of contracts that are concluded between the investor and the contractor in the process of creating the restaurant industry facilities.



**Fig. 3. PMC contract strategies [12]**

If the customer has limited financial resources, it is better to choose an *EPCS* contract, which will reduce costs by reducing the share of liability of the contractor. If you need to build an object in a short time, it is better to choose an *EPCM* contract, because it allows you to carry out land works and laying the foundation in the incomplete design of the ground part of the object, which saves time. The investor can delegate his powers to the contractor by signing an *EPC* contract, if he has sufficient funds and time and is not worried about the aesthetic design of the future project.

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