THE ANNALS OF "DUNAREA DE JOS" UNIVERSITY OF GALATI
FASCICLE XI – SHIPBUILDING. ISSN (print) 1221-4620, ISSN (online) 2668-3156
2019

SOME APPRECIATIONS CONCERNING THE PERFORMANCE INDICATORS OF THE MARITIME SHIPREPAIRS SHIPYARDS

Manea Emil
Constanta Shipyard – Romania
Greece Branch Office
E-mail: snc_cn@yahoo.com

ABSTRACT

An organization, to effectively use the information obtained from measuring performance, has to make the transition from measuring range to analysis and decision, which represents performance management. This offers the possibility for the performance indicators measurements analysis, which helps define the major objectives of the organization, on different terms and main ways of achieving them, together with the resources allocated to achieve a competitive advantage in the field. The performance indicators can be strategic, managerial and operational, measuring three components - business, profitability and productivity. The results monitor the activities performed and costs incurred, constituting the standard measure that allows to examine and highlight strategies for sustainability objectives achievement. The paper presents a series of personal observations and comments regarding performance indicators - as a result of its author's professional experience - and leads to the conclusion that the options for a performance-oriented shipyard strategy should be developed based on its own business characteristics through the following: agresive marketing – low costs; strategic alliance with the equipment suppliers - differentiating services; orientation towards a particular ships market segment – focusing.

Keywords: performance indicators, shipyards, shiprepairs, shipyards management, strategy, quality managment.

1. INTRODUCTION

In a simplistic formulation, the following definition can be accepted: an organization is a structured system of human interaction in order to achieve common goals. [1]

For an organization, at least four general features can be defined and identified, as follows [2]:

• conscious coordination, which implies the existence of a manager, respectively the management functions exercise within the organization;

• the relatively identifiable form representing the formal and structural framework of the organization, which differentiates it from other social entities;

• continuous formal links, which are the joining element of the members of the organization and make the organization work;

• common goals, specific to each organization, considered as the mission of the organization; the existence of these goals has a dual role for the organization: it offers, on the one hand, the reason for the existence of the organization, and on the other hand, it creates the basis of motivation for the members of the organization.

The strategy of an organization can be defined [3] as the set of the long-term objectives of the organization, the main ways of achieving them, together with the resources allocated for this, in order to obtain the competitive advantage according to the mission of the organization.

Organizing is a process that includes establishing the activities necessary to achieve the objectives, setting them as tasks and arranging them in a decision-making framework [4].

The functioning of an organization generally means the process of carrying out the specific activities of the organization, a process by which it is expressed, first of all, the ability to dynamically correlate the resources (human and extrahuman) with the assumed purpose [5].

The decision is defined [6] as the rational act of choosing an action line that aims to achieve the objectives, taking into account the available resources.

The decision is the central point of the management activity, as it is found in all its functions.

The decision-making system is the sum of the interdependent elements that determine the elaboration and substantiation of the decisions (or all the decisions taken and implemented, structured according to the system of objectives and the configuration of the managerial hierarchy) [7].

Organizational performance consists of the results that the organization achieves, being related to the organizational objectives. Performance management ensures companies more success and an advantageous positioning in front of the competitors.

Whenever they have the opportunity, the organizations affirm that they want to achieve performance, or to improve their performance for the obtained performance level which is measured. The identification and measurement of performance was called the "new discipline in management" [8].

Specialised literature recognizes three generations of performance measurement [9]:

• balanced measurement systems;

• flows and transformations correlation;

• financial aspects with non-financial ones correlation.

The performance indicators provide information on the extent to which the achievements correspond to the objectives adopted. Although measurement is a sine-qua-non condition of performance evaluation, it is not a purpose: it is not measured to measure, but to evaluate (verify). In its turn, evaluation is not a purpose in itself, but is a guiding tool. The role of management is to set the objective in advance, establishing the role of measurement and evaluation, and therefore of the performance indicators. The most complete definition of performance indicators is the one proposed by AFGI-Association Française de Gestion Industrielle and approved by AFNOR- Association Française de Normalization [10].

A performance indicator is quantified data that measures the effectiveness and / or the efficiency in whole or in part of a process or system (real or simulated), in relation to a norm, plan or objective determined and accepted within the strategic framework of the organization.

2. IDENTIFICATION OF MAIN PERFORMANCE INDICATORS FOR MARITIME SHIPREPAIRS SHIPYARDS

A shipyard is a complex organization whose objectives can be:

• designing and executing the construction of maritime ships;

• the execution of the maintenance and repair works according to the maintenance management systems of the dry-docked ships.

For the execution of the works, a complex structure made up of workshops, slipways, docks, berths and numerous installations and technical means capable to ensure the entire process of designing, execution and testing is necessary; in addition, the construction, launch and outfit of ships is required, as well as carrying out maintenance and repair works of maritime ships according to maintenance management systems on board.

The integrated management system refers to everything a shipyard needs (processes, procedures, structures, resources, etc.) in order to manage its processes and activi-

ties in full compatibility with the objectives oriented to profit and quality.

An integrated management system can be documented and implemented in a maritime shipyard for the execution of the maintenance work on board the operating ships, for the management of the processes and activities so that the execution of the maintenance work carried out on board the ships satisfies the objectives of their execution.

In addition, the safety and health of the employees, as well as the protection of the population in the vicinity, respectively of the environment are perceived as a purpose in themselves for the activities carried out by the shipyard.

An integrated management system has the necessary structure for establishing, implementing and reviewing the shipyard policy according to the standards:

- SR ISO 9001: 2015 Quality management system [11],

- SR ISO 14001: 2005 Environmental Management System [12] ,

- OHSAS 18001: 2009 Occupational Health and Safety Management System [13].

The results depend on the level of performance at which the employees develop, the performance management being the process that facilitates the creation of an environment in which the employees feel motivated to put their skills and qualities to the best of their ability.

To measure the efficiency of the processes of the management system, it is necessary to use performance indicators.

The use of performance indicators in carrying out the processes of the quality management system in a maritime shipyard for the execution of the maintenance works on board the operating vessels results in the transparent running of the processes, being easier to identify from early stages if and where there are weaknesses; this leads to the possibility of efficient development and application of the necessary corrective measures, thus carrying out the continuous im-
-provement process.

Also, the use of performance indicators in the processes of the quality management system results in:

- increasing customer confidence;

- improving the image of the maritime shipyard;

- meeting some legal requirements (for in auctions participation);

- eliminating redundant processes from production;

- minimizing the number of production errors;

- traceability - the possibility to identify a product in a process or after the completion of the maintenance work and the departure of the ship from the yard.

The use of performance indicators in carrying out the processes of the environmental management system in a maritime shipyard for the execution of the maintenance works on board the operating ships has as a result: the early identification of the environmental problems that may arise when carrying out the maintenance on board ships; reducing and preventing the occurrence of environmental incidents during the stationing of the ships in the shipyard for the execution of the maintenance work on board; improving the environmental performance of the shipyard; improving the relationship with governmental organizations; improving the public image; meeting legal requirements and reducing environmental incidents that may lead to legal liability.

The use of performance indicators in carrying out the processes of the occupational health and safety management system for the execution of maintenance works on board the operating ships has as a result: the reduction and prevention of the potential for work-related accidents; the reduction of labour incidents that lead to legal responsibilities; improvement of working conditions; more effective control over risk factors [14]; improving communication and employee relations; staff loyalty by improving working conditions; improving public image, increasing customer confidence.

3. AUTHOR'S PROPOSALS ON PERFORMANCE INDICATORS IN SHIPREPAIR SHIPYARDS

The performance indicators necessary to be analyzed as a priority are based on the information of the tendering and scheduling-planning activities carried out in the shipyards for the execution of the maintenance works of the maritime ships, as these are considered to be most important for the approval and signing of a contract.

The tendering and scheduling-planning activities carried out in the shipyards for the execution of the maintenance works of the maritime vessels are the result of estimates that operate with fixed data, conditioned by variables belonging to a wide spectrum of conditions and limitations such as: the level of the maritime transport market; weather conditions in certain periods in the geographical area where the shipyard is located; the type, capacity and age of the ship; differences in volume of the final works performed, compared to the initial estimate, due to the existing technical conditions found in the systems, installations and equipment of the ship after the beginning of the maintenance works.

Internal development, by the owner, of the tendering processes as price and time, the negotiations for contracting the execution, the execution and the delivery of the ship at the completion of the maintenance works, is according to the presentations in Figs. 1, 2 and 3.

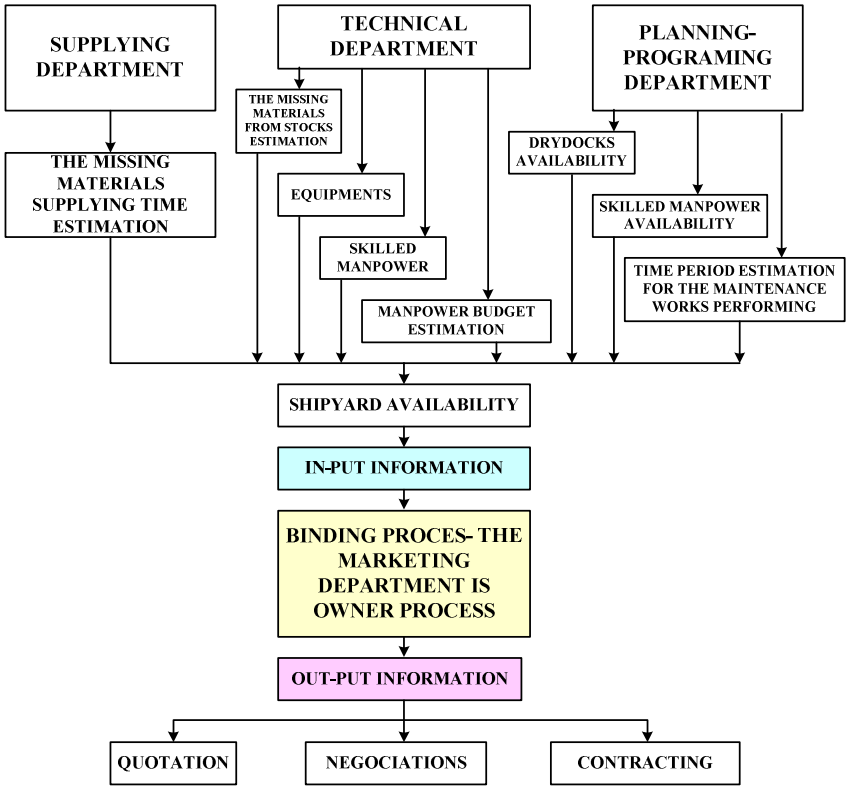

Fig. 1. The Marketing Department internal conducting for bidding, negotiation and contracting

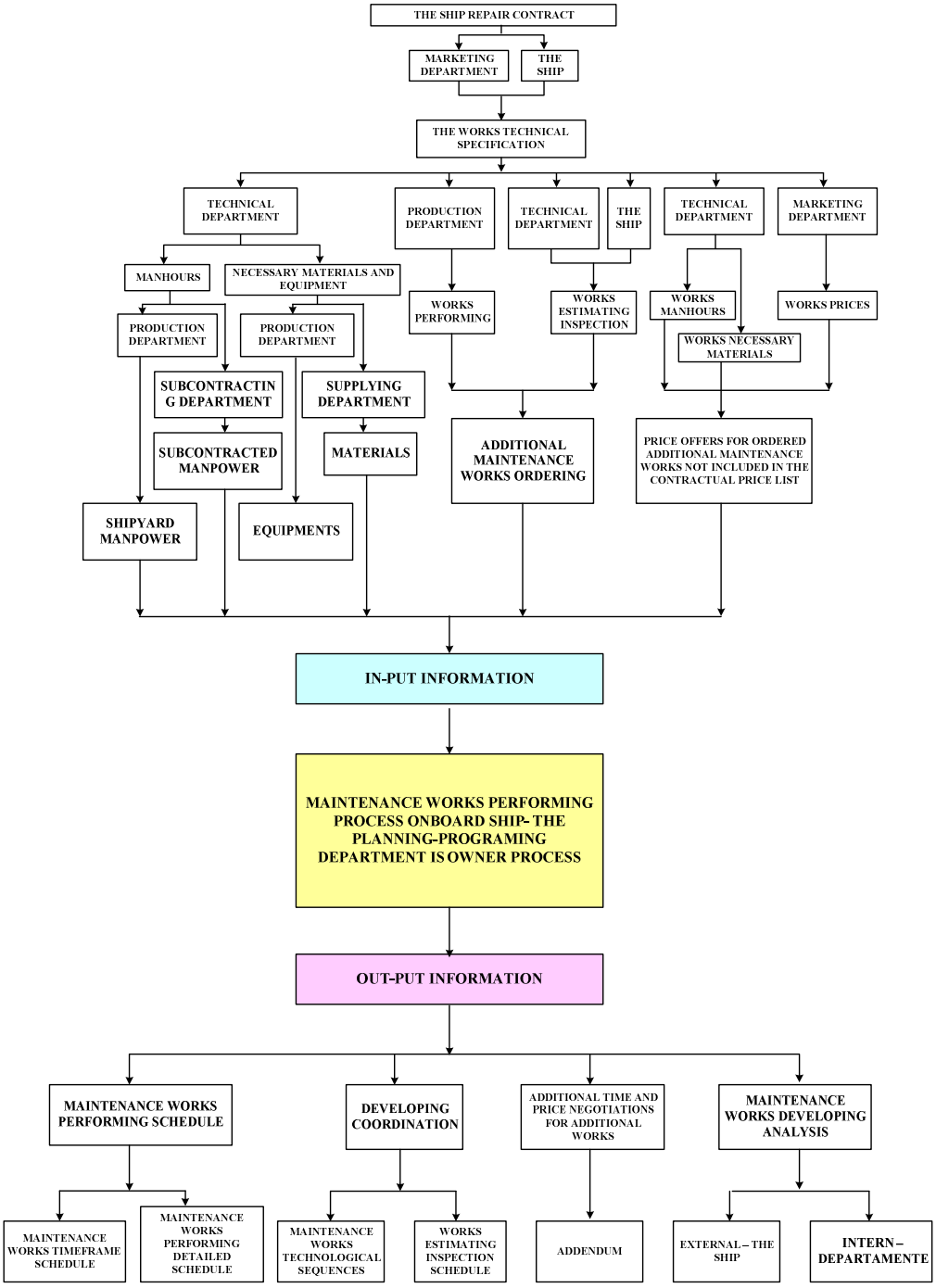

Fig. 2. The Planning Programming Department internal conducting for the maintenance works performed on board the ship

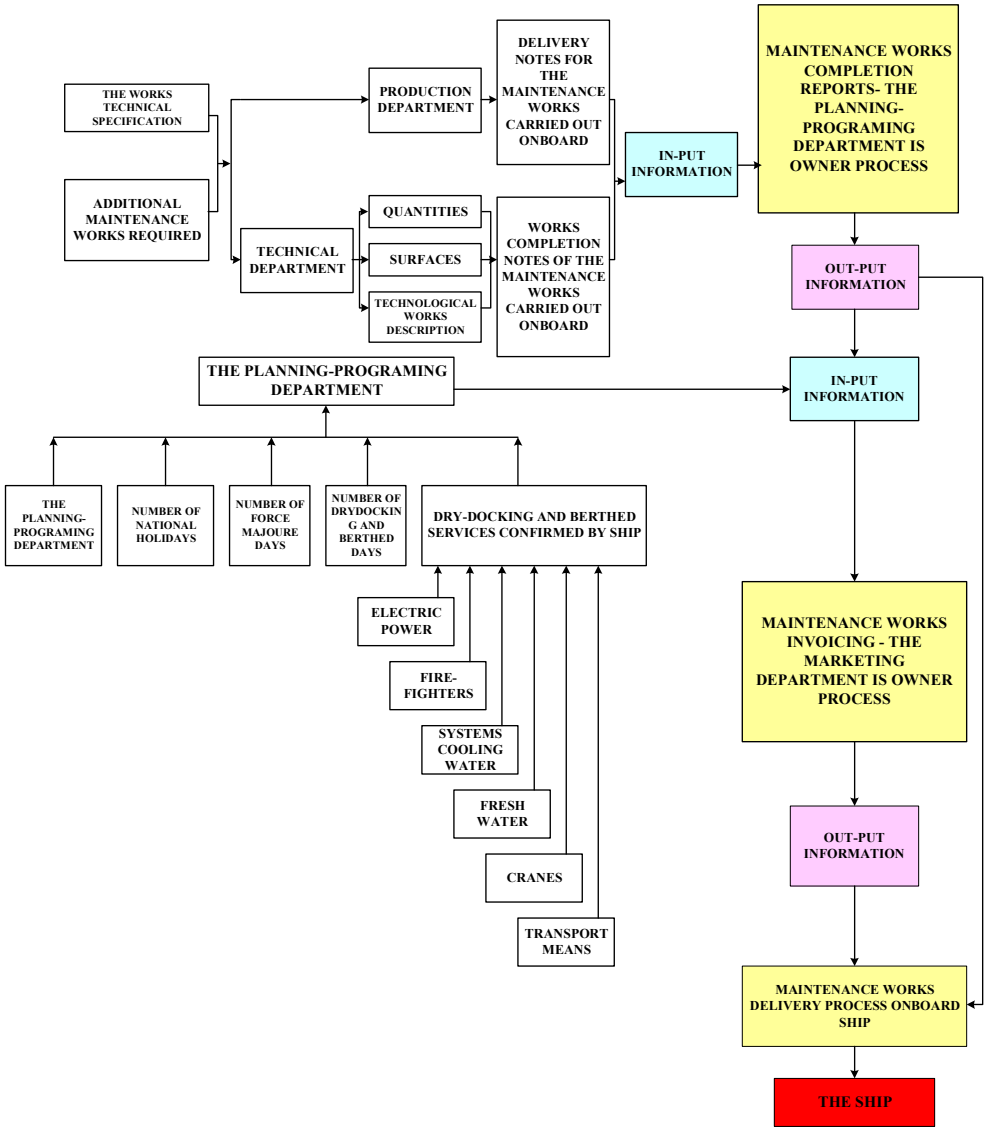

Fig. 3. The Planning-Programming Department & The Marketing Department internal conducting for the maintenance works delivery onboard the ship after completion

4. RESULTS AND DISCUSSION

The performance indicators [15] that need to be analyzed as a priority are based on the information on the tendering and programming-planning activities carried out in the shipyards carrying out the maintenance work of the maritime vessels, as they are considered to be a priority for the approval and signing of a contract.

Tendering for work-performance indicators arises from:

• the number of quotations transmitted to the clients and the number of accepted quotations for contracting the execution of the maintenance works according to: geo-

graphical area; types of ships (oil tanks, bulk vessels, container vessels) and their constructive characteristics;

• the number of quotations accepted for contracting the execution of the maintenance works, at which the final invoice was under the project estimated budget on the Maintenance and Repairs works Quotation based on the Technical Works Specification Requirments prepared by the Owner / Technical Manager (customer profile -number of projects, geographical area; the volume and type of cancelled works; docking, treatment and painting of surfaces, steel structures renewing, piping, mechanical, electrical).

For the programming planning activity, the performance indicators arise from:

• the number of unsolicited quotations due to the lack of docking capacities validity during the period required by customers (customer profile - number of vessels; geographical area; types of ships and their dimensions; period required for docking);

• the number of contracted ships that exceeded the agreed term of works completion (number of days delay; types of ships and their dimensions; volume and type of works that led to exceeding the term of completion; docking, treatment and painting of surfaces, steel structures renewing, piping, mechanical, electrical).

• the number of contracted ships that were delayed on arrival at the shipyard for the execution timely commencement of the maintenance works.

The bidding and scheduling-planning activities carried out in the shipyards for the execution of the maintenance works of the maritime vessels are the result of estimates that operate with fixed data conditioned by variables belonging to a wide spectrum of conditions and limitations, such as:

- the level of the maritime transport market;
- weather conditions in certain periods in the geographical area where the shipyard is located;
- the type, capacity and age of the ship; differences in volume of the final works performed compared to the initial estimation due to the existing technical conditions found in the systems, installations and equipment of the ship after the beginning of the maintenance works.

5. CONCLUSIONS

According to the requirements of the shipping companies, in order to maintain the competitiveness in economic efficiency conditions, the shipyards which execute maintenance works of maritime ships analyze their performance indicators with reference to: the percentage of contracting related to the number of offers submitted; the percentage of the reimbursement of the manufacturing costs / ship; duration of the dock cycle by types of vessels; the number of days of delay in the delivery of the ships; the process of repeating the technical inspections for defects / ship.

The management of these shipyards, through its functions of planning, organizing and training - coordination, establishes the objectives of improving the performances, chooses the ways to reach them and elaborates strategies and policies for the processes of tendering, contracting, preparing the execution of the works, delivery of the ship, testing and trials, preparation and approval of the completion of works carried out on board, preparation of the final invoice, conditions of the guarantee period.

The organizational performance of a shiprepairs shipyard is extremely important for shipowners, who often have to choose a compromise solution between the costs and quality of repair and maintenance work.

The purpose of the research included in this paper was to contribute, in part, to the systematization of the processes carried out in a shipyard repair yard by outlining the processes: tendering, negotiation and contracting by the Marketing Department; the execution of maintenance works on board the ship by the Production Programming Department; for the delivery of the maintenance works performed on board the ship by the

Production Programming and Marketing Department.

The author's efforts were materialized in proposing an original model for the institutional relations Evaluation Sheet (which, due to length constraints, is not included in this paper; those interested are asked to contact the author at the mentioned correspondence address).

Acknowledgements

The author thanks the top management of the Shipyard Constanţa S.A., for supporting the documentation of the researches carried out, for the collegial, appreciative and critical-constructive environment .

REFERENCES

[1]. **Raboca, H.M.,** *Teorie şi comportament organizaţional*, Curs Universitatea Babeş-Bolyai, 2003.

[2]. **Nicolescu, O.,** *Management comparat, Uniunea Europeană, Japonia şi S.U.A.*, Bucureşti, Editura Economică, 2006.

[3]. **Greenberg, J.,** *Behavior in organizations* (10th ed.)., Upper Saddle River, NJ: Prentice Hall, 2011.

[4]. **Verboncu. I., Nicolescu,** O., *Managementul organizaţiei*, Bucureşti, Editura Economică, 2007.

[5]. **Burns. E.Tom., Stalker, G.M.,** *The Management of Innovation*, University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship, 1961.

[6]. **Niculescu, M., Lavalette,** G., *Strategii de creştere*, Bucureşti, Editura Economică, 1999.

[7]. **Pierce, J., Robinson, R.,** *Comparative Strategy*, Irwin, Boston, 1991.

[8]. **A. Neely,** *Business performance measurement: unifying theories and integrating practice*, 2-nd edition, Cambridge University Press, 2007.

[9]. **A. Neely, C. Adams,** *The Performance Prism: The Scorecard for Measuring and Managing Business Success*, Financial Times, Prentice Hall, 2002.

[10]. **Avasilcăi S.,** *Managementul performanţei organizaţionale*, Editura Tehnopress, Iaşi, 2001.

[11]. *** SR EN ISO 9001:2015 Sisteme de management al calităţii. Cerinţe.

[12]. *** SR. EN ISO 14001:2005 Sisteme de management al mediului.

[13]. *** SR. EN OHSAS 1800:2008 Sisteme de management al sănătăţii şi securităţii ocupaţionale.

[14]. **Manea E., Manea M.G.,** *The risk concept and the impact on the organizational performance of maritime shiprepairs shipyards*, International Conference Advances in Engineering and Management, ADEM, 2018, Drobeta-TurnuSeverin, http://www.imst.ro/adem/, https://www.scientific.net/AEF.34/5, Trans Tech Publications Ltd.,https://doi.org/10.4028/ www.scientific.net/AEF.34

[15]. **Manea E., Militaru C., Zăgan R., Chiţu M.G.,** *Improving organizational performance through the application of integrated management systems in maintenance activities in the shipyards*, Analele Universităţii Maritime din Constanţa, 2016, pp.221-228, https://cmu-edu.eu/anale/wp-content/uploads/sites/10/2016/02/aparitia-completa-vol.24.pdf

Paper received on November 9th, 2019