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EFFECT OF RISK MANAGEMENT IMPLEMENTATION ON PRODUCTIVITY IMPROVEMENT

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Abstract: *The companies from the naval sector are subject to a strong pressure from competitors and clients; this results in a high level of exigency in the execution of their projects. Within this framework, the application of the existing best practices and the use of worldwide project management standards become key pieces for these companies. This article puts forward the experiences gathered from the adaptation of the PMI methodology to a SME from Galician naval auxiliary industry. It deals with the different risk management implementation stages of a strategic project, showing the advantages and the keys to the project's success.*
Key words: *adaptation, SME, naval sector, risks, PMI*

1. INTRODUCTION

Much has been written about risk management in big companies but there is little bibliography on the use of the PMI methodology in SME. Examples are the studies of *Delisle & St-Pierre* (2003), *Blanc-Alquier & Lagasse-Tignol* (2006) and *Rosu et al.* (2010) but their application is restricted and is usually developed for project-oriented organizations.

The main problem for a SME to implement this kind of methodologies is that the existing standards for project management were intended for large projects. In this project, the client has "guided" the SME in a suitable risk management implementation. The achievement has been to adapt the PMI methodology to create its own one adapted to the company's special characteristics. In addition to delivering the order fulfilling its specifications, this was about implementing a simple, agile risk management, adapted to the nature of the project, organization's sector and company culture that could be applied to future projects. The aim was to find proper indicators for particular processes and to find methodology that would help identify those (Nagyova & Pacaiova, 2009).

2. CASE STUDY

The Project we are about to analyze, "design and manufacture of 8 fender davits, was a significant strategic project in 2010. It began as such at the request of the customer, who follows the guidelines of Project Management Body of Knowledge (PMBok, 2008). This project's success was a milestone: it meant the introduction of the SME into a highly competitive new market.

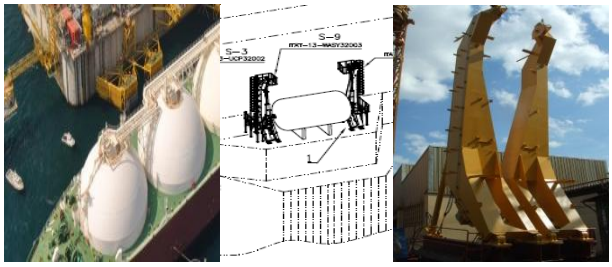

Fig. 1. Technical characteristics

DESIGN AND MANUFACTURE OF FENDER DAVITS	
Order:	4 pairs of davits for gas extraction platform
Customer:	Leading Norwegian multinational company
Delivery:	One year from order's acceptance
Price:	1.300.000 € (22% of turnover)
Estimated cost:	800,000 € (38% profit)
Delay records:	30-day average delay
Cost records:	15% increase from initial budget

Tab. 1. Project's initial considerations

2.1 Risk Management Plan (RMP)

Describe the procedure for the identification, analysis, prioritization and monitoring of the risks associated to the project (figure 2).

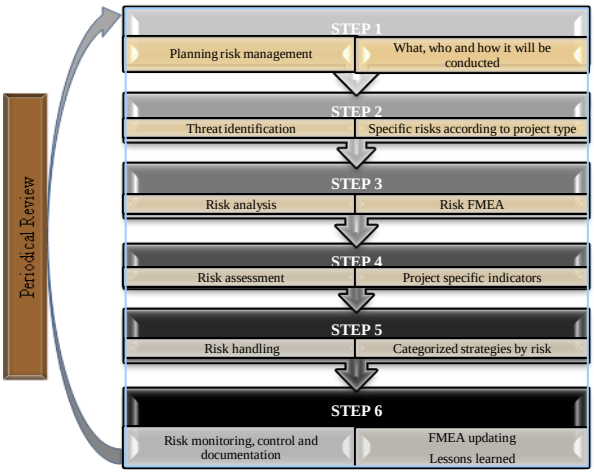

Fig. 2. Risk Management Plan Methodology

2.2 Risk Management Planning

The process covered the following aspects:

Organization: an external auditor was hired by customer; he acted as the project's risk management centre, coordinating the agents implied and integrating the management of the risks identified in the subprojects.

Roles and responsibilities: RMP chart defines three figures and their responsibilities:

- Risk management coordinator: external auditor hired by customer.
- Subproject Manager: responsible for each subproject.
- Member of team project: members of each team assigned.

Activities: actions defined in two process groups: planning and implementation; indicating for each of them which techniques were used, who the responsible is, who takes part in that activity, which deliverable is obtained and how often each activity is conducted (table 2).

Action procedures: course of action was divided into two procedures according to the risk management phase:

- Identification, analysis and action plan
- Monitoring and control.

When	Planning	Planning	Planning
Action	Risk Identification	Risk Identification	Qualitative Risk Analysis
Technique	Brainstorming	Checklist	FMEA
Manager	Project manager	Project manager	Project manager
Participants	Team project	Team project	Team project
Deliverables	Risk Register Document	Risk Register Document	Risk Register, probability & impact matrix, non-priority risks list
Periodicity	Once at beginning; also at every monitoring meeting	Once at beginning of project	Once at beginning of project; at every monitoring meeting

Tab. 2. Risk Management Planning Process Activities

. ***Controls:*** Risk Management Coordinator reviewed actions associated to risks monthly through the Internal Monitoring Report (IMR) and specifically when high exposure risks arose.
. ***Metrics:*** measures including enough information to alert on potential harm and help identify all kinds of risks (table 3).

Name of metrics	Description/formula
Number of Risks and Impact	Description: No. of project´s risks by impact 1,2,3,4 Formula: no. of risks
Number of Risks and Probability	Description: No. project´s risks by probability 1,2,3,4 Formula: No. of risks
Risk priority Number (RPN)	Description: RPN assessment Formula: criteria
Number of Risks becoming impacts	Description: No. of project´s risks that became impacts Formula: No. of risks

Tab. 3. Risk Management Plan Metrics

. ***Records of risks and events:*** Risk Register Document included all information about Project risks.

2.3 Risk Identification

Risks were identified in the management, execution and closure process using brainstorming and checklist analysis techniques. The main categorized risks of the project planning process are:

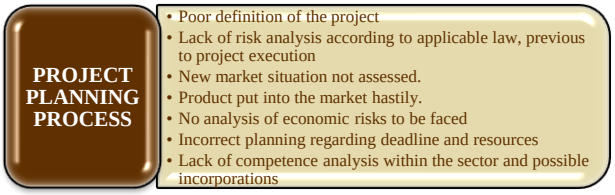

Fig. 3. Identification of Categorized Risks

2.4 Risks analysis, assessment, handling, monitoring and control

The Failure Mode & Effect Analysis (FMEA) was the risk management key tool. A practical document containing the maximum information in the minimum space was sought. Risk assessment was been carried out based on its impact on costs, deadlines and scope, as well as level of possibility of occurrence. Figure 4 shows the scales.

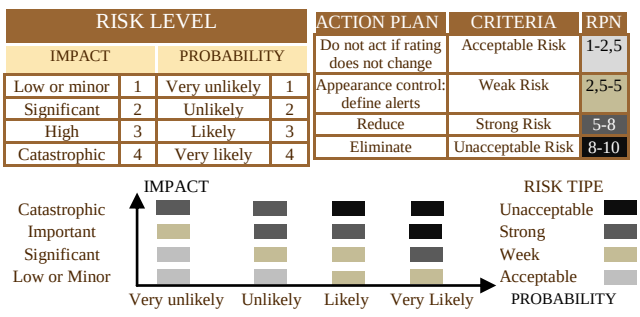

Fig. 4. Rating scales

On the one hand, the FMEA applied includes a list of risks, prioritized once assessment based on impact and probability of occurrence ratings, whose product will provide the Risk Priority Number (RPN). On the other hand, it covered the strategy to be followed to keep or reduce the number. Figure 5 shows the treatment of one of the risks.

RISK IDENTIFICATION AND PRIORITIZATION						
PROJECT STAGE	ASSOCIATED RISKS	IMPACT			PROBABILITY	RPN
		COST	PERIOD	SCOPE		
Planning	Management not implied	3	4	3	4	5,7

RISK HANDLING							
ACTION	PEOPLE RESPONS.	PERIOD	IMPACT			PROBA-BILITY	RPN
			COST	PERIOD	SCOPE		
Management assumes leadership	Management	Project´s length	2	2	2	2	0,6

Fig. 5. Failure Mode & Effect Analysis (FMEA)
Source: Sara Marcelino-Sádaba, Amaya-Ezcurdia (Dyna 2010)

3. RESULTS & CONCLUSIONS

Results obtained are shown in table below:

	THEORICAL	REAL
Deadline	30-day average delay	Within the stipulated period; no delays
Price	1.300.000€ (22% of turnover)	1.300.000€ (22% of turnover)
Cost	920.000€ (800.000+15%)	864.000€ (800.000+8%)
Benefit	29% benefit (cost of 920.000€)	33.54% benefit (cost of 864.000€)
Cost increase	15% increase from budget	8% increase from budget
Customer satisfaction	Survey average rating of 2 (scale 2-5)	Survey average rating of 4 (scale 2-5)
Product quality	Medium	High

Table 4. Results obtained

The implementation of the PMI methodology was the milestone in this project's success for a SME motivated to be consolidated in such a competitive sector and to enter a new market; and has set a turning point in its working method.

4. ACKNOWLEDGEMENTS

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