

**THE CONTRIBUTION OF RISK ANALYSIS TO IMPROVED PROJECT MANAGEMENT
(THE CASE OF SONATRACH HASSI R'MEL)*****MARREF Souad**Laboratory of Research in Industrial Prevention (LRPI) of Industrial Health and Safety Institute,
University Mostefa benboualid Batna2- of Batna Algeria**Received 12th May 2024; Accepted 15th June 2024; Published online 30th July 2024**

Abstract

Companies are currently facing new challenges and growing problems due to :

- The complexity, uncertainty and extreme competition of the economic, industrial and social environment
- Difficulties encountered in managing their projects

To meet these challenges, it has been necessary to seek to improve the methods of controlling this process and to integrate in a complementary way "Project Management" in companies, particularly in developing countries. "Cooper (2004), p. 400.

Project management covers all the knowledge, skills and methods, applied to the activities of a project, with a view to achieving the expectations of the project's stakeholders and consequently finding a balance between competing constraints, such as: cost, deadlines, quality and different expectations between stakeholders and identified (needs) or unidentified (expectations) requirements.

As a result, another function is needed, "Risk Management", which must be fully integrated into the overall project management process, and which must generally be based on a continuous and iterative process.

To this end, a concrete study was carried out on the SONATRACH site, in the Hassi R'mel field, by integrating these two Management concepts, based on the methodology for evaluating project objectives (ACB) and the methodology for analysing project risks (ARP). "Le bissonnais (2003), p. 54.

Keywords: Project Management, Risk Management, Industrial Risks, Hydrocarbon Industry, Cost-Benefit Analysis, Project Risk Analysis.

INTRODUCTION

Project management involves trying to avoid risks, i.e. the possibility that carrying out the project will lead to results that differ from the intended objectives, with the difference being considered harmful. The cause of a risk may be :

- Or an uncertainty, at the time of planning (an event whose occurrence is not probable or whose consequences cannot be assessed). "Lamand (1993), p.161".
- Or a hazard (i.e. a more or less probable event that disrupts the execution of planned processes);
- Or an unforeseen event occurring during the course of the project. The notion of risk is inseparable from the notion of project.

Uncertainty is intrinsic to the life of any organisation. So one of the main challenges for management is to determine an acceptable degree of uncertainty in order to optimise value creation, an objective that is considered to be the basic premise in the concept of risk management risks. Uncertainty is a source of risks and opportunities, which can create or destroy value. Risk management offers the possibility of providing an effective response to the risks and opportunities associated with the uncertainties facing the organisation, thereby strengthening the organisation's ability to create value. "ISO 14001/2004".

The organisation's value is maximised when management develops a strategy and sets objectives to achieve an optimal balance between growth and return objectives and the associated risks, and when it deploys the appropriate resources to achieve these objectives. "Cooper (2004), p. 400". In order to control risks, a number of activities need to be implemented in an iterative fashion throughout the duration of the project: project risk analysis, risk reduction and risk monitoring. The results of these activities must be capitalised on within the organisation so that future projects can benefit from the experience acquired. This is a major concern for SONATRACH Hassi R'mel. "Courtot (1998), p. 294. in order to :

- Recognise the potential risks that threaten it
- Examine these risks in their entirety
- And above all, to overcome them. And to do this, we use two tools: CBA and PRA.

METHODS AND TOOLS

Today, the methods used for what is still often referred to as risk management are based on a widely shared and agreed foundation. "Lamand (1993), p.161", "Cooper & Chapman (1987), p. 260", "AFNOR, 2002, p. 480".

- Project risks are assessed
- An action plan is put in place
- Risks and action plans are regularly monitored

In terms of risk management assistance, tools are now used more as a complement to analysis than as methods in their own

*Corresponding Author: **MARREF Souad**

Laboratory of Research in Industrial Prevention (LRPI) of Industrial Health and Safety Institute, University Mostefa benboualid Batna2- of Batna Algeria

right. There are several types of tool. "Revue du GRECO (2001), p.293", "Mc Manus (2003), p.182", "Thiriez (2004), p.223".

Statistical Tools

The artificial intelligence foundations of analysis models heuristic tools

Benefits of the CBA approach :

Veret & Mekouar (2005), p.354", "Maders & Masselin (2005), p.226":

- Clarify the elements taken into account in the analysis, and provide a structured framework for debating their relative importance.
- Integrate the interests of the various stakeholders.
- encourage consultation, the exchange of information and even the challenging of a decision by providing a structured framework for comparing the various components of a decision;
- Carry out a sensitivity analysis and determine which assumptions or input data have the greatest impact on the results of the analysis;
- Keep a record of the factors that led to the choice of one option over others at a given time. This record can prove invaluable when it comes to justifying a decision several years - or even decades - later.

These elements improve the transparency of the decision-making process, see figure below.

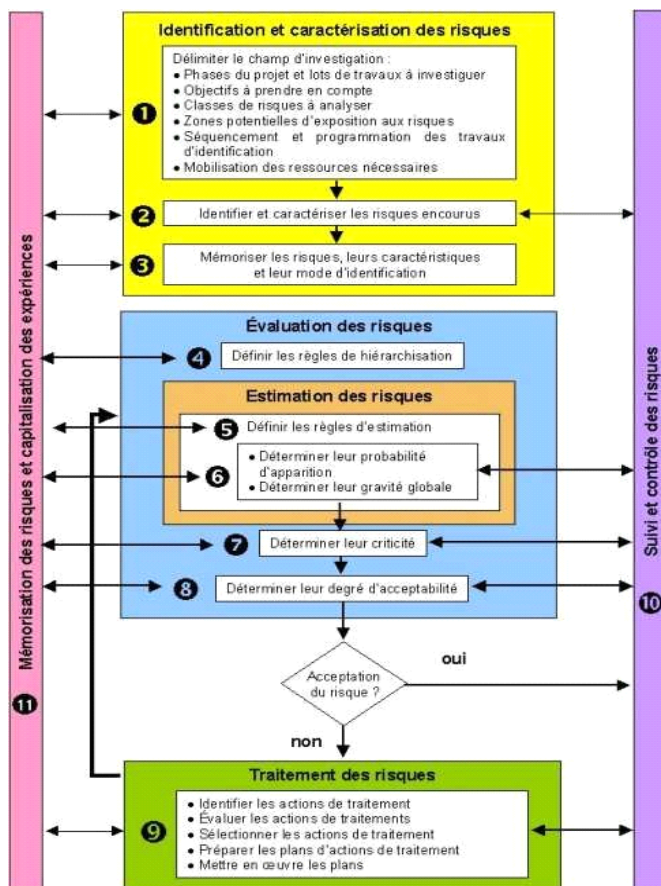


Figure 1. Project risk management process (FD X50-117). "De Lagarde (2005), p.145"

- Adaptation of the CBA method for the analysis of objectives - SONATRACH Hassi R'mel project:
- General description

SONATRACH (ENTP Hassi R'mel) is located in southern Algeria, in an industrial and commercial zone. It has a fairly large workforce and its markets are local, national and even export-oriented.

- Risk analysis for SONATRACH (Hassi R'mel ENTP station)

The latest accidents and disasters to have occurred within the SONATRACH group, and in particular at the Hassi R'mel complex, show that traditional safety management is not sufficient to improve prevention techniques, and that it is more than necessary to opt for a different approach to managing safety in the workplace. Thus, the use of Project Management by Risk Management using the CBA and RPA methods has been envisaged for the entire SONATRACH Group. The "Project Management through Risk Management" programme was launched for the Centre region in February 2009. A diagnostic guide will be used to identify the parameters of the various risks associated with project management. Following this, additional means of prevention and protection will be identified and proposed to the holders of the positions, and the most unfavourable conditions will be dealt with in accordance with the regulations in force.

In this context, the company has changed its vision of safety at work and has adopted a management tool that is flexible, scalable and adapted to an environment that is constantly evolving:

- Setting up the organisational prerequisites
- Specifying the different scenarios
- Defining the scope of the analysis
- List the consequences and choose the indicators to measure them
- Costs and benefits to be recognised
- Quantitatively predict the consequences over the life of the project
- Monetising the consequences
- Discounting future costs and benefits
- Analysing the robustness of results
- Make a recommendation for a decision
- Writing and publishing a report
- Project risk analysis

The "De Lagarde (2005), p.145" ARP (Analyse des Risques Programme) method and its supporting IT tool (the "APSYS" software package) have been developed since 1987. They form the basis of a methodology designed to analyse and take into account all project risks (technical risks, human risks, legal risks, organisational risks, etc.) and not just technological risks.

- The benefits of project risk analysis (PRA)
Risk management does not mean refusing to take risks!
It is a process of anticipating and dealing with possible risks. It is only a tool to help the project achieve its goal.

- Overall approach: Figure 2

Figure 2. PMR Risk Management Plan

- Risk identification: this stage involves :
- Qualitative assessment
- Quantitative assessment
- Using databases (references) and Monte Carlo type statistical methods, estimate the duration and cost of each part of the WBS/PBS and deduce the probabilities of deadlines and the overall cost of the project.
- Prioritising, treating and reducing risks
- Monitoring and control
- Feedback

Table 1. Example of an assessment framework applied to SONATRACH Hassi R'mel [company data]

Niveau	Probabilité	Gravité_Coûts	Gravité_Délais	Gravité_Qualité
1 : faible	Très peu probable	Surcoût < 5 %	Retard < 1 s.	Spécifications très peu modifiées (< 5 %)
2 : moyen	Assez probable	Surcoût < 10 %	Retard < 1 m.	1 fonction secondaire compromise
3 : fort	Quasi certain	Surcoût > 10 %	Retard > 1 m.	1 fonction principale compromise

- Criticality $C = P \times G$
- Where $G = \text{MAX}(G_{\text{cost}}; G_{\text{time}}; G_{\text{quality}})$
- Qualitative assessment
- Define risk criticality $C = P \times G$
- CDP defines the P and G grids
- -number of levels
- -threshold quantification
- individual work (8 to 15 days)
- Collected and summarised at a meeting
- Obtaining the C
- Risk prioritisation

Table 2. Example of a criticality grid applied to SONATRACH Hassi R'mel [company data]

Grille de criticité		Gravité		
		1	2	3
Probabilité	1	101		403
	2		205	
	3			127

- Green: risks acceptable as they stand
- Orange: risks requiring special monitoring
- Red: risks requiring immediate priority treatment

Quantitative assessment

Using databases (references) and Monte-Carlo type statistical methods, estimate the duration and cost of each part of the WBS/PBS and deduce the probabilities of deadlines and the overall cost of the project.

- Prioritising, treating and reducing risks

Action on the most critical risks

- Elimination of risk (alternative scenarios)
- Transfer of risk
- Risk mitigation (P / G / D)
- Acceptance under surveillance
- Emergency plans if the risk occurs
- Appointment of a risk manager
- Creation of a risk sheet (IN2P3 tool)
- Communication to the whole team

Monitoring and control

Implementation of action plans Prevention treatment Crisis management

Regular updates of the ARP

- Phase changes
- Unforeseen events
- New challenges

Feedback

Very important for capitalising on knowledge of qualitative and quantitative analysis

Conclusion

Industrial risk management raises many questions that cannot be answered with a simple "yes" or "no":

- What criteria should the company use to decide that the risks of an industrial facility have been reduced as low as reasonably practicable?
- How do you arbitrate between considerations that have different "dimensions": potential deaths and injuries in the event of an industrial accident, potential environmental impacts, financial stakes, employment development, forced relocation in the event of house expropriation, etc.? And with impacts on multiple stakeholders (people living near industrial facilities, site operators and employees, local and regional elected representatives, etc.)?

The only way to answer these questions is to use the most objective method possible to aid decision-making and dialogue between stakeholders. Cost-Benefit Analysis is a method that has made it possible to respond to these needs, in addition to the PRA method, which has made it possible to identify all the project risks and take corrective action beforehand, and then prevent these risks.

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