

# MANAGEMENT OF THE RISKS

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EDITIONS

## 2 *On the Management of the risks project and Applications*

	Page
0. Summary .....	2
1. Abstract .....	7
2. Problematic .....	8
3. Recall on financing on project .....	9
4. Exploratory recalls .....	11
4.1. Activity of project .....	11
4.2. System .....	11
4.3. Indiciary .....	11
4.4. Elements of assessment .....	13
4.4.1. Scale of gravity .....	13
4.4.2. Scale of probability .....	15
4.5. Elements of decision .....	15
4.5.1. Picture of global acceptability of the generic risks .....	16
4.5.2. Picture of acceptability of the global delay risks .....	17
4.5.3. Picture of acceptability of the risks of global on cost .....	17
5. General gait of the risks project management .....	18
5.1. Description of the gait .....	18

*On the Management of the risks project and Applications*

3

5.2. Organization and scheduling of the analyses .....20

*On the Management of the risks project and Applications*

5.3. Documentation .....20

5.3.1. Plan of risks project management .....21

5.3.2. Report of risks project management .....23

5.3.3. REX chapter of the risks project in the balance of project end.....24

6. Process of risks project management .....24

6.1. Acceptable risk definition .....24

6.1.1. Definition of the risks acceptable project .....25

6.1.2. Allowance by phase of the risks of delay and on cost .....25

6.2. Identification of the risks .....25

6.3. Assessment and hierarchization of the impacts .....26

6.4. Definition and funding of the resulting actions .....26

6.5. Management of the vestigial risk .....28

7. Typology of the generic dangers of project .....29

7.1. Dangers bound to the organization of project .....29

7.2. Dangers bound to the conduct of project .....30

7.3. Dangers bound to the technical and operational performance engineering 31

7.4. Dangers bound to the management calendaire and financial .....32

7.5. Dangers bound to the contractual interfaces .....33

8. Examples of pictures of analysis of the risks .....	35
4 <i>On the Management of the risks project and Applications</i>	
8.1. Pictures of analysis of the global or generic risks .....	35
8.2. Pictures of analysis of the delay risks .....	36
8.3. Pictures of analysis of the risks of on cost .....	37
9. Application to the management of the risks of an industrial system .....	38
9.1. Management of the risks of a special project .....	38
9.1.1. Specificities .....	38
9.1.2. Objectives of working safety .....	39
9.1.3. Picture 6.3. : Relation between gravity and criterias of conception or operational.....	41
9.1.4. Analysis of the risks system .....	43
9.1.5. Management of the risks security in tests of development .....	45
9.2. Process of identification and assessment of the risks .....	45
10. Multi-dimensional analyses of the management of the risks Case: Situations dangerous of an industrial system .....	51
10.1. TextToBin: Text->Binary .....	51
10.2. PCA: Correlation matrix PCA .....	51
10.3. KTabUtil: Init KTab .....	55
10.4. Bin-Bin ; $C \cdot \text{Log}[a \cdot x + b]$ .....	55
10.5. DDUtil: Diagonalization .....	56
10.6. COA: Correspondence Analysis .....	57
10.7. Files Util: Transpose .....	58

10.8. MCA: Multiple correspondence Analysis .....	58
<i>On the Management of the risks project and Applications</i> .....	5
10.9. Canonical: Generalized Canonical Analysis .....	61
10.10. Text ToBin: Text->Binary .....	67
10.11. KTA-MFA: Separate analyses .....	67
10.12. STATIS: Operator averaging .....	69
11. Multi-dimensional analyses of the risks project management	
Case: Synthesis of the results of a spatial system. Ariane program .....	72
11.1. Text ToBin: Text->Binary .....	72
11.2. PCA: Correlation matrix PCA .....	72
11.3. COA: Correspondence Analysis .....	76
11.4 DDUtil: Add normed Scores .....	76
11.5. HTA: Column centring .....	81
11.6. MatAlg: Diagonalization $A \rightarrow V \& L$ with $A * V = V * L$ .....	82
11.7. PCA: After row % transformation PCA .....	82
11.8. Categ Var: Read Categ File .....	85
11.9. Categ Var: Categ ->Bloc .....	85
11.10. DDUTil: Diagonalization .....	85
11.11. KTabUTil: TabToKTab .....	86
11.12. Categ Var: Quant ->Categ .....	86
11.13. COA: Row weighted COA .....	88
11.14. DDUTil: Rows: Inertia analysis .....	89

6            *On the Management of the risks project and Applications*

11.15. MCA: Multiple Correspondence Analysis: Variable number 1 has 10 categories.....	90
11.16. MCA: Multiple Correspondence Analysis: Variable number 1 has 21 categories.....	92
11.17. KTab UTil: centring Ktab .....	95
11.18. KTA – MFA: Separate analyses .....	95
11.19. STATIS: Operator averaging .....	97
12. Findings and Perspectives of the research works .....	100
13. Bibliography .....	102

On the Management of the risks project and  
Multi-dimensional analyses

**1. Abstract**

The domains concerned by studies of risks project are:

- The technical or operational performances (delivered product no - compliant to the specifications, refusal of the users);
- The financial means and the budgets (unavailability of resources or on costs);
- The scheduling (delays of delivery with or without on costs).

To answer if need be increasing of the modern societies to evolve in minimal situation of danger, the management of the risks became, since several years, a complementary activity and no get round of the engineering activities in a project or exploitation of an operational system. The research of the safety of facilities either industrial products and of the security of people and goods that results some make part of every citizen's daily life henceforth.

The inventors who study and develop these indispensable facilities to our activities are, for the essential, of the engineers. Their large scientific and technical expertise, their rigorous and effective methodologies are incontestable assets. One can regret however that the abuse of the deductive logic in their formation and generally in the selection of intelligences misleads an excessive culture of the certainties in the minds to the detriment of a critical and innovating approach. To palliate this fact, the development of the research activities in the schools of engineers permitted to develop among the pupils the training of the doubt.

The management of the risks requires acquire a frame of mind that accepts to take in account in its gait the uncertainty and the events dreaded, partners mainly at random in order to measure the impacts of it and to take the actions of mastery that must impose themselves.

In these works of research, we propose a precious support so much to the level of the reflection that of the methods for all engineers and more globally all people, starting or experienced, brought to undertake a gait of management of the risks in a very open panel of activities, and of the multi-dimensional analyses of the risks project management.

## **2. Problematic**

To the starting of a project, the cost to the completion and the delays foreseen is defined from the performances specified of the system and the contractual environment of its development.

In the setting of a perfectly definite industrial politics, the management of project is the activity associated to the iterative process whose main functions are:

- The definition of the development strategy;
- The useful information acquirement... through the indicators;
- The assessment of his impact... on the progress of the project;
- The decision makings... to maintain the project on the good cape;
- The control of their application... to guarantee the reach of the objectives;
- The human and material means coordination, to reach objectives specified by the customer in terms of performances, costs and delays.

The strategy setting up by the person responsible of project to arrive there must take in account the factors of risks, that means the uncertainties, the sources of danger or the disruptions that exist structurally before the starting of the project and / or that can occur circumstantial during his progress while searching for and mastering those susceptible to drag the failure of his project.

The risks project that must be considered in the analyses and the assessments is the next one:

- Risks in interface with and coming from the customer;
- Risks interns of the team project;
- Risks in interface with and coming from the industrial;
- Risks in interface bound to the sites of exploitation.

Following the critique of these risks, the treatment is individual and specific or more generally global through the margins for risks that have been taken to the level of the means put in place to answer the objective triple of the project. Says otherwise, the politics of mastery and management of the risks aims to contain all relative risks to the non reach of the objectives of performances, costs and delays in definite limits and accepted.

The chapter 3, we recall the financing of a project that depends on the raw margin of self-financing generated by the project after its completion. Three analyses of risk, rest on an analysis of the expertise of the constructor and its subcontractors.



The chapter 4, we recall that a representative system of the projects can be formed of four or five coins systems or elements. The users or the operators are included in the client "perimeter" insofar as they express some needs accept and financed by the customer. The assessments are made from the scales of gravity and probability of the risks.

The chapter 5, propose a gait of the risks project management, founded on the systematic application of five stages. Notably: to define the set of the objectives; to identify the uncertainties and the problems bound; to value and to hierarchy their impacts; to define and to strengthen the suitable solutions; to manage the vestigial risks and to control the application of the actions during the length of the project.

The chapter 6, propose the process of risks project management. Notably: to define the acceptable risks; to identify the risks in terms of factors of risk or situations to risks, susceptible to put in failure the objectives of the project, to value and to hierarchy the impacts; to define and to strengthen the resulting actions; to manage the vestigial risk.

The chapter 7, propose a typology of the generic dangers of project. Notably: dangers bound to the organization of project; dangers bound to the conduct of project; dangers bound to the technical and operational performance engineering; dangers bound to the management calendaire and financial; dangers bound to the contractual interfaces.

The chapter 8, propose some examples of pictures of analysis of the risks.

The chapter 9, propose an application to the management of the risks of an industrial system.

The chapter 10, propose multi-dimensional analyses of the risks project management. Case: of the dangerous situations of an industrial system.

The chapter 11, also propose multi-dimensional analyses of the risks project management. Case of the synthesis of the results of a spatial system: Ariane program.

The chapter 12, propose a conclusion and perspectives of the research works.

### **3. Recall on financing on project**

Financing on project (the translation generally used to translate the term project finances is financing of project) can be characterized by the fact that the loan (of financing of the project) depends the raw margin of self-financing generated by the project after its completion. The lending banks incur the risks that are bound to the very nature of the project therefore, and either only to the borrower's financial solidity.

They are brought therefore to do (more precisely to make execute) of the risk analyses [Benichou, 1996].

10

*On the Management of the risks project and Applications*

However, the manner to achieve these analyses of risk is, at the very least, very different from the approaches presented in the rest of these works.

- Risk of non reach of the performances: in the setting of a financing on project, the principle of basis consists in using tried techniques. The analysis consists therefore in demonstrating that the used techniques are known and mastered by the engineering / the constructor. This analysis, like all other analyses of technical origin risk done in the setting of a financing on project is achieved by a consultant (independent or society) expert of the domain concerned. It examines the degree of experience on each of the technologies and their degree of compatibility: this analysis of risk is therefore, in fact, a report of appraisal.

The technological failure risk having been examined thus, the risk of non reach of the production level hoped (risk of unavailability) is studied by realization of an operation of collection of information of the availability noted on equivalent facilities (benchmarking).

- Risk of on cost: the analysis of the risks of on cost made by the consultant consists in to review the amount of the investments foreseen by the initiator of the project.
- Risk of delay: the risk of delay also consists for the consultant in to review the planning of realization by exam critical of the delays allocated to each of the tasks.

These three analyses of risk rest on an analysis of the expertise of the constructor and his subcontractors, always under the shape of an appraisal report based on noted facts.

In conclusion, the analytic techniques of analysis of the risks are rather used by the initiator of the project (the industrial) that it is in the setting of a classic financing of project or financing on project. Thus, a detailed availability survey according to the gait permitted to define the strictly necessary investments to the realization of a train of liquefaction of gas [Bean, 2002], [ISO/ TR 12489].

## **4. Exploratory recalls**

### **4.1. Activity of project**

An activity of project can be considered like a system [Desroches, 2010].

### **4.2. System**

The representative system of the projects can be considered like formed of four or five subsystems or elements (or intervening for the three first), to know:

- The customer, entity of the decision financing the project. It can be the master of work or the authority programs;
- The group constituted internal support project and / or external, placed under the responsibility of a project chief;
- The contracting industrial (masters of industrial task and under - contractors)
- The site of exploitation of the material system developed by the group project;
- The user, exploiting the system that the customer places at the disposal at the end of the development (after the operational qualification). The user has a consultative role and can make part or no of the entity customer.

### **REMARK**

The users or the operators are included in the client "perimeter" insofar as they express some needs accept and financed by the customer.

### **4.3. Indicatory**

The indicators of the management of the risks are precursors "or" small bells of alarms "that indicate quantitative manner the state, at one time, of realization of the project. They are associated to the state of the evolution of each of the three objectives of the project.

a) The verisimilitude of an event is the confidence granted to the realization of this event. It is defined by the probability of p occurrence of this event:

\* The verisimilitude of a danger or a risk is the probability of occurrence of an event that is not wanted, that is identified like damaging to the advancement of the project;