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Risk Management Programs Specific to the Technological Processes

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Abstract

The main objective of the risk management characteristic actions is the maintaining of the stability in working by the optimization of the use degree of the resources specific to the operation, inspection and reparation of the systems which are in use.
In the paper there are presented the usual techniques of risks' identification and appreciation that may constitute useful managerial instruments in the development of technological processes assurance increasing programs.

***Keyword*:** risk management, optimization, inspection and evaluation, technological process

General considerations

The risk management may be defined as being: "a basic complex process of the management decisions, made as a program, completed by precise roles and responsibilities concerning the daily operations, technical assistance and operator decisions". The risk management includes both the risk (evaluation and control) and aspects of the integrity management (attenuation methods, performance attenuation measurements methods, risk control organization).

The risk management recognizes that it is not possible to eliminate all the risks ant that the best way to control the risks is the analytical and economic utilization of the available resources and not the blind observance of a norm, this meaning that the approach is changing from the "normative" (restrictive) methods concerning the projection (designing) and the operation of the installations to the establishment of the aims.

The managerial actions

The aptitudes evaluation of the safely utilization of an installation is recommended to be realized in a risk management integrity system (fig. 1). In this way each non-concordance found

out during the process is evaluated as a seriousness in some risk analysis based on scripts and the possibility of precise appreciation of an intervention opportunity will considerably increase, simultaneously with the minimal decrease of the unexpected events generation risk (accidents, damages, service interruption etc.).

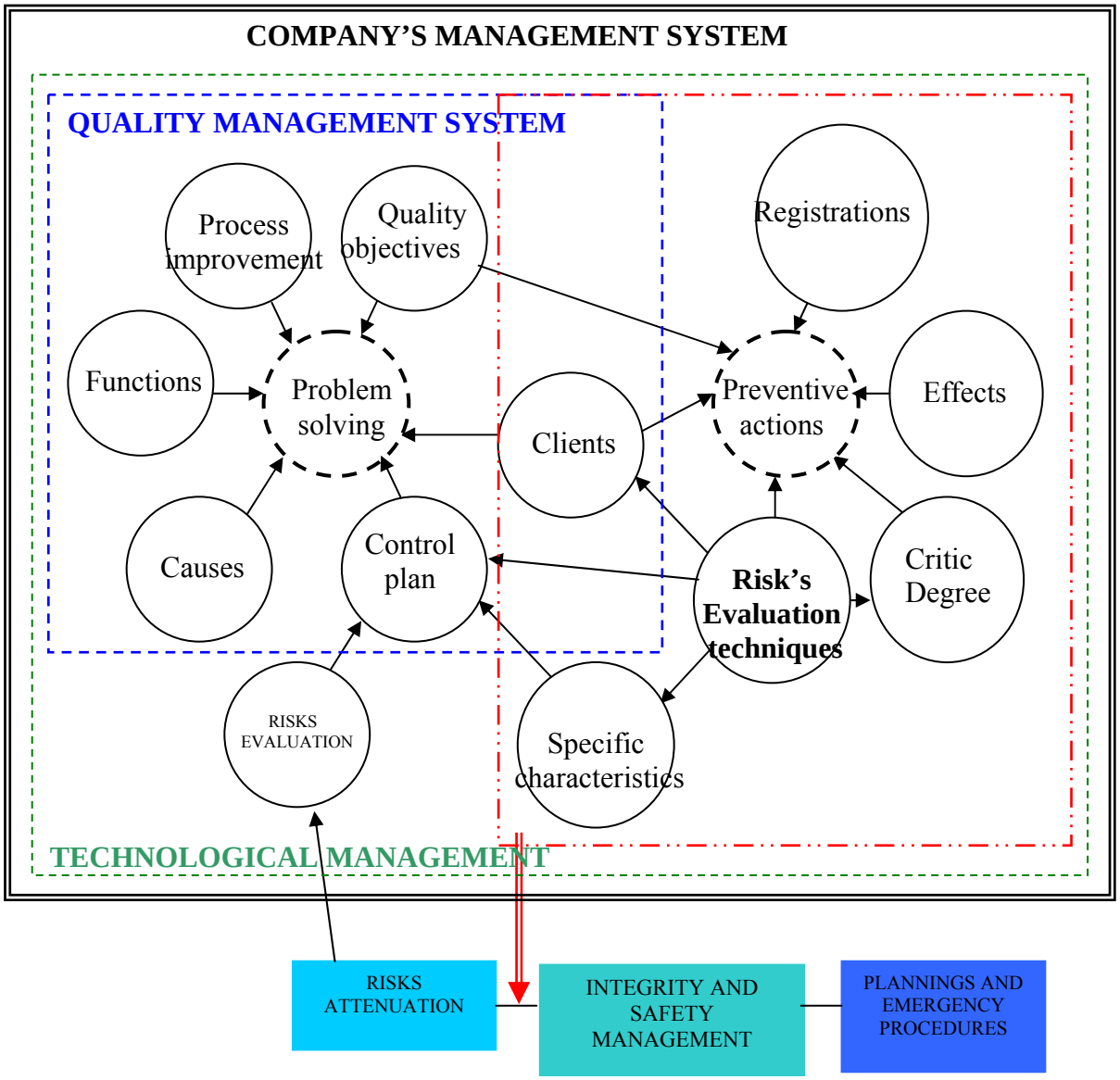

Fig. 1. Risk management integrity system at a technological process

The appreciation and hierarchy risk criteria are own to each installation (in accordance with the activity field) and their details degree is the obligation of the managerial team. Generally, the hierarchy of the risk factors in a technological process has as base the classification of the risk generators sources. An example in this way is presented in the table 1.

The managerial actions concerning the risk factor hierarchy (tab. 2) are fully justified if it is analyzed the gravity of the consequences that result from the manifestation possibility of these factors. In this way, it was taken into consideration the following aspects:

- ✓ The injury of the working / supervisor personnel;
- ✓ Damages, destroys / losses of goods, values;
- ✓ Impact on the environment;

✓ Deterioration of the reputation for the company / clients and / or consumers injury.

Table 1. The appreciation of the dangers sources at a technological process

Generator source of risk	**Dangers / risks**
People Employees Personnel	1. New or inexperienced personnel. 2. Visitors or unauthorized persons. 3. Inappropriate communication. 4. Insufficient number. 5. Competence.
Technical equipments	1. Equipments, machines, pots. 2. Incorrect utilization of the equipments. 3. Maintenance mode. 4. Disturbing installment. 5. Ancientness or wear.
Materials	1. Dangerous, inflammable or explosive substances. 2. Inappropriate storage.
Work environment	1. Work in closed places. 2. Brawling. 3. Temperature. 4. Electricity. 5. Ventilation.
Technological processes	1. Possibility of emergency situations. 2. Incorrect working procedures. 3. Inadequate work safety system. 4. Incorrect designing. 5. Lack of instruction or training. 6. Lack of information, instructions, control.

Table 2. The managerial attitude matrix at the risk factors hierarchy

RISK FACTOR	**ACTION AND TIME SCALD**
TRIVIAL (MINOR)	There are not necessary action and there is not necessary the registrations to be kept
TOLERABLE	There are not necessary supplementary controls. It could be taken into consideration a solution that has an effective cost not too big or an improvement that imposes a burden of the supplementary costs. The monitoring is imposed in order to have the certainty of controls maintain.
MODERATE	Efforts will be done in order to reduce the risk, but the prevention costs have to be carefully measured and limited. The measures of risks decrease have to be implemented in a definite period of time. Where the moderate risk is associated to very injury consequences, it may be necessary an ulterior evaluation in order to establish more precisely the injuries probabilities as basis of the improvement need conditioning of the control measures.
SUBSTANTIAL	The activity will be interrupted until the implementation of the measures required by the risk decrease. Considerable resources could be allocated for the risk decrease. In zones where the risk is drawn in the deroulment of the personnel activity or has repercussions on the clients' safety, it must be taken urgent actions.
INTOLERABLE	The activity will not be restarted as long the risk is still increased. If it is not possible the risk could be decreased requiring unlimited resources, the activity will get a prohibitive character.

The gravity of the consequences will be established on severity degrees, quantified differently in accordance with the social, economic or environmental studied category. On this base it is made an evaluation of the social and economic consequences and in accordance with their severity and probability degree, there are given scores classified in three categories: LS – Low Severity, MS – Average Severity, HS – High Severity (fig. 2).

The implementation of an efficient management program in the risk field (fig. 3) supposes that on the basis of the analysis presented mentioned before to implement a procedure set that has to offer control solutions and risk decrease starting from characteristic situations of an exploited installation specifying the approach order of the corrective measures (fig 4).

Severity or gravity	The probability of an incident					The attitude scald toward the risk level
	Very Improbable **1 pt.**	Improbable but Imaginable **2 pt.**	Possible but not currently **3 pt.**	Probable without astounding **4 pt.**	**Very probable without doubts 5 pct.**	
	1 LS	**2 LS**	**3 LS**	**4 LS**	**5 LS**	The equipment / installation functioning is developed in acceptable conditions. It will be continuously analyzed for an ulterior decrease of risks.
	2 LS	**4 LS**	**6 LS**	**8 MS**	**10 MS**	The equipment/ installation functioning will be developed only with suited authorization under surveillance and only after the consulting of a specialist. Where it is possible, the activity will be redefined and it will be taken into consideration the dangers and the identified risks that have to be decreased, before the operations start.
	3 LS	**6 LS**	**9 MS**	**12 MS**	**15 HS**	
	4 LS	**8 MS**	**12 MS**	**16 HS**	**20 HS**	The equipment / installation functioning has to be interrupted/delayed. The activity will be redefined; it will be taken supplementary measures in order to decrease the risk. It will be done a conformity reevaluation for the acceptable risk before the equipment / installation starts to function.
	5 LS	**10 MS**	**15 HS**	**20 HS**	**25 HS**	

Fig. 2. The risk factors hierarchy matrix

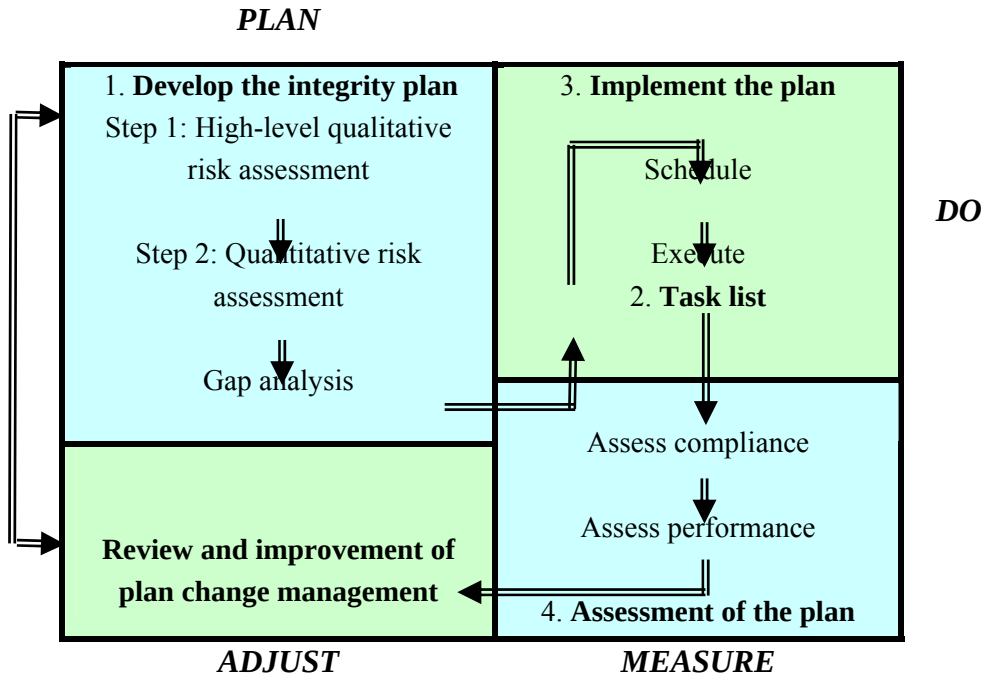

Figure 3. The structure of a risk management program

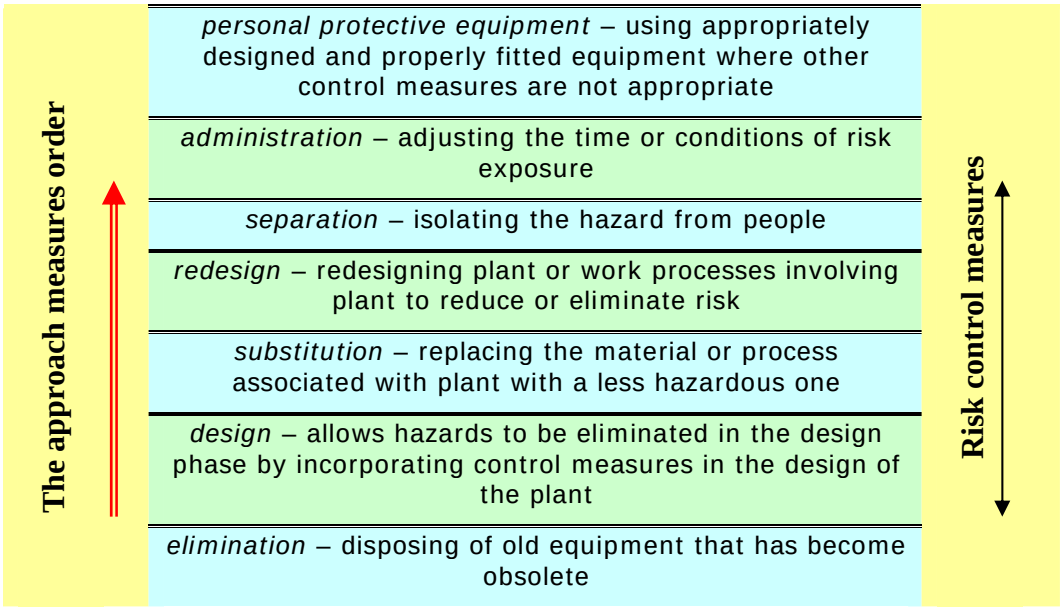

Fig. 4. The risks control measures hierarchy

Conclusions

Because the evaluation of the safety use aptitude of an installation is essential for establishing the maintenance, rehabilitation and modernization programs, it is recommended that this activity to be realized in an integrate risk management system.

The most usual risk's evaluation instruments are the qualitative ones. The quantification of the results may be realized (on the basis of some grading sheets given by the evaluator) by using the risks matrix.

The manager has the task to interpret all these results and to decide the risk's level of gravity having the opportunity having the opportunity to choose thus the most appropriate remediation measures.

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Programe de management al riscului specifice proceselor tehnologice

Rezumat

Principalul obiectiv caracteristic acțiunilor de management al riscului îl reprezintă menținerea stabilității procesului şi optimizarea resurselor specifice operării, inspecției şi reparării sistemelor aflate în exploatare.
În lucrare sunt prezentate tehnici uzuale de identificare şi apreciere a riscurilor, care pot constitui instrumente manageriale utile în dezvoltarea programelor de creştere a siguranței proceselor tehnologice.