MANAGEMENT FEATURES OF SAFETY AND OCCUPATIONAL HEALTH APPLIED IN INTEGRATED SYSTEMS FOR AGRO-FOOD PRODUCTION

PhD student Eng. Cătălin CRIŞAN,
Mechanical Engineering Faculty,
POLITEHNICA University, Timişoara,
cata_crisan2003@yahoo.com

Professor Dumitru MNERIE, Ph.D.
Mechanical Engineering Faculty,
POLITEHNICA University, Timişoara,
dumitru_mnerie@yahoo.com

Professor Dumitru ŢUCU, Ph.D.
Mechanical Engineering Faculty,
POLITEHNICA University, Timişoara,
d_tucu@yahoo.com

REZUMAT.Activităţile în companiile de producţie agro-alimentară, organizate după principiul sistemelor integrate sunt efectuate într-un context unitar. Acest articol prezintă unele caracteristici ale sistemului de securitate şi sănătate în muncă, integrat în managementul general al companiei. Sunt prezentate, de asemenea, unele probleme legate de monitorizarea stării de siguranţă a lucrătorului, prin urmărirea acţiunilor privind reducerea, până la eliminare, a factorilor de risc pentru fiecare loc de muncă, cu specific agro-alimentar.

Cuvinte cheie: management, agro-alimentar, sistem integrat, securitate, sănătate, factor de risc.

ABSTRACT.The activities in the agro-food production companies organized by the principle of integrated systems are performed in a unitary context. This paper presents some features of the safety and occupational health system integrated in the general management of the company. Are presented also some issues related to the monitoring the state of worker safety by reducing to the elimination of the risk factors for each job, with that agro-food specific .

Keywords: management, agro-food, integrated system, safety, health, risk factor.

1. INTRODUCTION

In terms of functional, *integrated systems* can be unitary, providing a closed circuit of inputs, and output function in order to achieve something useful or to achieve a goal. A business in an integrated system that requires a primary basis is the starting point of a cyclical development. This connection between system elements can reduce many of barriers to economic, commercial, industrial and business.

The stages in conception and planning integrated for a production system are:

- analyses of available personal resources;
- choose business;
- establish the main objectives for integrated system;
- create the strategy;
- financial and budget plan; elements for evaluation and monitoring the system.

Each technologic flux has a high complexity but it's very important to see the system like a whole unit. It's really necessary an unit vision, with the possibility to preview all causes for block the system, then we must remark the zone with high-risk possibilities It's preferable to use an integrated system, where can use minimum an available element (raw material source, the personal land, equipment for processing, personal network marketing, other).

2. MATERIALS AND METHODS

Align Romanian legislation with the European legal framework, especially with the entry into force of the law nr.319/2006, the implementation of safety and occupational health management system (OHSMS) it realize that single unit, independent.

The aim of OHSMS's is to support and promote good OHS practices, including self regulation, according to company's particularities.

Given the particularities of the integrated agro-food production, it is considered the general management system design with inclouding of the OHSMS. ***Figure 1*** predict interdependencies between compartments essential an integrated production.

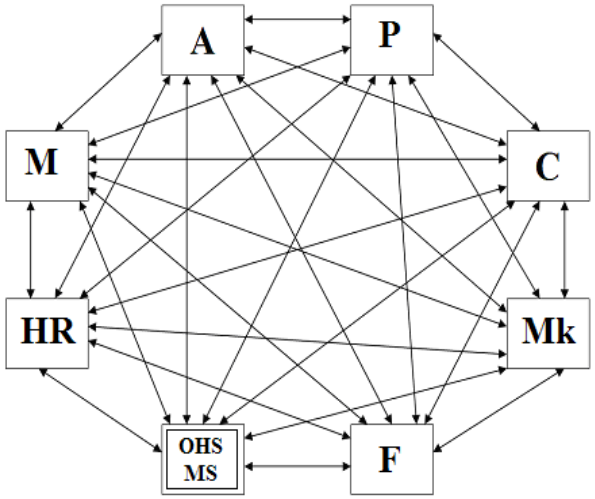

Figure 1. – *OHSMS integrated inside of General Management system.*

This OHSAS Standard is based on the methodology known as Plan-Do-Check-Act (PDCA). PDCA is a step cycle for problem solving and includes planning (definition of a problem and a hypothesis about possible causes and solutions), doing (implementing), checking (evaluating the results), and action (back to plan if the results are unsatisfactory or standardization if the results are satisfactory) (Moen, 2006).

Integrated systems for agro-food production features:

1. Usually medium sized enterprises;
2. There is an production manager for every branch of company.
3. Complex hierarchy;
4. Production and agriculture activities. Usually the company have grain silo ;
5. The company has indoor and outdoor activities
6. There is a big variety of jobs;
7. There is a variety of working equipments;
8. Tractor drivers work in isolation conditions;

Organization's top management shall define an appropriate OHS **policy**. The policy must provide a framework for setting and reviewing OHS objectives, must be communicated to all personnel and be available to interested parties.

The OHS policy should be reviewed periodically to ensure that it remains relevant and appropriate to the organization. Change is inevitable, as legislation and societal expectations evolve; consequently, the organization's OHS policy and OHS management system need to be reviewed regularly to ensure their continuing suitability and effectiveness. [OHSAS18002:2008]

The **planning** phase of the management system cycle starts with hazard identification, risk assessment, then continues with determining risk mitigation measures. The mitigation or control measures must comply with prevention principles presented in the third paragraph of this paper.

Implementation and operation include:

- resources allocation;
- establishing and implementing of roles, responsibilities and internal procedures;
- implementing procedures for workers training, competence and awareness;
- control of documents;
- documentation;
- operational control;
- emergency preparedness and response;

OHS performance monitoring and measurement, evaluation of compliance (including incident investigations) and control of records are done in the forth phase, the **checking** phase. All the required information is obtained commonly by internal OHS system audits.

In the last cycle phase, **management review**, top management shall examine the OHS management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need for changes to the OHS management system, including the OHS policy and OHS objectives. [OHSAS 18002:2007]

Five work places representative of the following activities were studied:

- tractor driver;
- operator in grain silo;
- animal caretaker;
- meat processing operator;
- refrigeration operator.

After that were formed complex and multidisciplinary assessment teams that included, occupational safety specialists, engineers, technologists, ergonomists, occupational health specialists were formed, adding operators directly involved in manufacturing. The coordonator of the team was the specialist in occupational safety of the company, whose main role was to harmonize the views of other evaluators in the sense of subordination and integration of the criteria used by each of them ; the goal was to evaluate the level of work safety.

The risk was defined as the probability of a process of work to be involved in an accident or an occupational disease with a specific frequency and seriousness of the consequences.

The risk factor found at the work place is due to the presence of risk factors for injury and disease.

Therefore, the elements that can be used to characterize the risk factor, in order to determinate its coordinates, are in fact the likelyhood that an action of a risk factor would lead to an accident and the severity of the consequence on the victim.

In consequence, the following steps for risk and security assessment were established:

- identifying the risk factors from the analyzed system;
- determining the consequences of action on the victim, which means determining the severity of them
- determining their action on probability performer;
- assignment of risk levels depending on severity and likelihood of consequences of action of risk factors.

For each case, global levels of risk have been identified by the relationship:

$$N_r = \frac{\sum_{i=1}^{n} r_i \cdot R_i}{\sum_{i=1}^{n} r_i}$$

where:
Nr - risk is the global workplace;
ri - rank risk factor "i";
Ri - the level of risk to the risk factor "i";
n - numbter of risk factors identified in the workplace.

In the experiment forms of the job evaluation including determining the value of the overall risk level job were used. These were developed, for quantitative determination of the level of risk / safety for a job, for carrying out a manufacturing process.

The job sheet drawn is the grounding for prevention of work accidents and occupational diseases for work, for each manufacturing process program.

The summary of the method identifies all the risk factors in the analyzed system (jobs) based on predetermined checklists and risk quantification based on the combination of size and frequency of gravity within the foreseeable consequence.

The method can be used both in the conception and design of jobs and the operational phase. Its application, however, requires complex formed teams of people both in specialized occupational safety and technology review (Peer + technology).
Results were popularized by the conspicuous display of the global risk level, with sufficient explanation of how to determine the value.

After a period of approximately one month, the assessment was repeated with the same team, with the identification of mitigation measures, to eliminate risk factors and their levels.

3. RESULTS AND DISSCUSION

The measures have been submitted to the accounting departments in order to assess their implementation costs, indicating possible effects on wages operators.

These reports were presented to the teams involved directly in manufacturing.

Following this discussion, occupational safety specialists have restored the action plans and have presented them to the top management, accompanied by some conclusions. Then, a process of reassessment and rearrangement of operators on every job, and also some improvements in technical systems, in most cases, with reduced costs were implemented.

This process was repeated 2 more times at intervals of 9 months.

The experiment lasted two years with a remarkable effect of increasing the security of manufacturing processes and the efficiency of re-engineering strategies.

4. CONCLUSIONS

The specific character of integrated agro-food production has an important impact on company's OHS management. Due to various and complex activities, there are an unusual large number of risk factors, which leads to a medium-high OHS global risk level.

For optimizing the safety and health at work related to employment implemented manufacturing processes, each risk factor was evaluated in evolution through multiple computer processes.

The nomination of jobs allowed the accomplishment of a complex analysis of each component of the work system: performer, means of production, work load and working environment, interactions and mutual influences.[1]

Experimental method used is also based on psychological and sociological aspects of work. The procedure is to follow and present synergistic aspects of the system by increasing the liability of the operator and the entire team.

The particularities of manufacturing processes based on nonconventional technologies draw attention to machinery designers, OHS specialists and production managers. Health and safety principles for risk mitigation are applied in all machine's life stages, from design to exploitation and dismounting.

Because, now, in many cases the ISAFP are medium sized enterprises, where usually designated OSH worker or external OHS consultant; it consider necessary to introduce the OHS office in subordination of the company's general manager, with direct links with HR, C and P, for a safe OHSMS integration in the general management of the company.

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NOTATIONS

OHS – Occupational Health and Safety
OHSMS – Occupational Health and Safety Management System
PDCA - Plan, Do, Check, Act
CPE - Collective Protection Equipment
PPE - Personal Protective Equipment
HF - High Frequency
ISAFP – Integrated System for Ago-Food Production
HR – human resurses,
M – maintenance,
A – agricultural sector
C – control,
P – processing,
Mk – marketing,
F – finance