The implementation of clean production

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Abstract: - In this article we present: the implementation of "clean production" which means production based on careful evaluation of the product since its design phase to ensure that both the product and processes related to it at all stages of its life cycle (ranging the extraction of raw materials, manufacturing, packaging, consumer / use, waste collection and treatment) promotes the interests of the community, in particular as regards the environment.

Clean production has four main elements:
- Caution, which involves taking measures insurers even in the case of yet unconfirmed suspicions concerning a potential nocivitate to human health or the environment;
- Prevention, as expression of conscience that is cheaper and more efficient to prevent environmental degradation than to provide remedies;
- Democratic participation in decision-making of all stakeholders
- An integrated and holistic approach.

Key-Words: - neural network, sweeping administration, prognosis, economic development, serial time.

1 Brainy prognosis systems used for sweepings administration
1.1. The importance of prognosis systems used for sweepings administration.

Prognosis systems of sweepings administration are able to stock real information, about some events and evolutions that can appearance in the future. The problem of sweepings administration is at present and each country must have a solution as regards number and proportion of cesspits.

Sweepings administration, an important composition of an environment strategy, is relegating at collecting, transportation, treatment and elimination sweepings activities.

In last decades more and more efforts are pointed in looking the best solution for stopping global pollution. For that were created the commissions for preventing pollution, governmental and non-governmental organisms for solving this problem partially at least, as regards variety and continuity of technologies [1].

The information technology and superficial brainy can play a very important role in getting over some impediments which appearance in tentative to prevent and stop pollution. Thus, in case of preventing or decreasing pollution we can find some IT actions steps:

i. the realization of some coherent informational substructure, intended to stock up the information (e.g. database of pollution premonition measures);
ii. the realization of some applications which can find the real answer at some problems which can’t be solved without IT programs help(e.g. furnaces used for the cremation of sweepings);
iii. other types of applications, such as:
* communication modules between different organisms interested in premonition pollution;
* children games whom subject is pollution in this way we can assure a good education of young people;
iv. the employment of neuronal networks for prognosis of sweepings administration using time serial;

The “pollution premonition” is a term used in USA and in Europe is used the term of “Cleaner Production” (PC). PC is a preventive onset of environment management. This concept is called also eco-efficacy, pollution premonition or green outputs [2].

PC is referring on modality of proprietary and services production without impact about environment, using the present technology and economy. PC doesn’t limit the development, this
one insists in order that development must be ecological.
PC must not be looked only like an environment strategy, because it takes in consideration also the economic aspect.
In PC context, the sweepings are treaty like an “output” which has negative economic value[5]. Whatever activities which intend to reduce the input of raw materials and energy, or intend to prevent or to reduce the sweepings can make the productivity to grow up and can bring financial profit.
Like “win-win” strategy, PC protects the environment, consumer and worker in the same time with increase of industrial efficacies, profitability and competitive.

1.2. The application of clean output
PC can be applying in many ways:
1.2.1 Overheads measures: the taking of measures at managerial and operational level for preventing:
- drippings
- trickles
1.2.2 The substitute of raw materials
- raw materials which are not so toxic (the substitute of whitening factors with chlorine)
- recycling materials (are : Sun, water, air, wood, the animals, etc.)
- materials which has a long existence.
1.2.3. The efficacy control of process: the check of process for making this efficient by reduction of sweepings and transmitter, the modification of :
- operation processes ;
- working instruction ;
1.2.4. The optimize of installations: the modification of installation for :
- the efficiency increase of production process;
- the decreasing of sweepings and pollution transmitters production;
1.2.5. The change of technology: for reduction of sweepings and transmitters production during process:
- the change of technology;
- the change of some technologic sequences.
1.2.6. The recycling on-site:
- the definition of sweepings;
- the decreasing of blocking demand and of treatment and storage price.
1.2.7. The production of secondary outputs: the conversion of sweepings in secondary outputs, which can be used as raw materials.

1.2.8. The output modification: the modification of output characteristics for:
- the decrease of medium impacts of output during its life;
- the decrease of medium impacts of production process.

1.3. The enterprise strategy
The strategy of an enterprise is the outline which defines:
- the enterprise purpose;
- the strategies which one the enterprise will follow it;
- the necessary resorts;
- the responsibilities;
The strategy is an ensemble of analytic methods used for understanding and increasing of enterprise position as regards the free trade zone. It makes the relationship between internal capability of enterprise and external condition of it [3].
The "liniation" of strategy will follow the mains tree levels:
1. operational strategy – which forecast the implementation methods of capital goods used by enterprise.
2. deal strategy – the methods of competitively maintenance and the win of new free trade zone ring;
3. enterprise strategy – ensemble of internal and external measures.
The competitively requests are:
- technique capacities;
- financial capacity.
The advantage of competitively win are;
1. tangibles elements : licensees, monopoly, etc
2. intangibles elements: the best managers, teamwork, etc.

PC is a world movement at par acceded a lot of trusts. The Pc method implementation makes good technical and financial enterprise performances. Actually techniques and concepts stand up of a new scientifique strategy, representing a big contribution at reach of objectives and resolving the environment protection problem. As strategy of environment performances increase, PC is situated successfully in competitive enterprise strategy.

1.4 The implement of “cleaner production”
PC means any which activity reduces the amount of losses produced in a commercial his enterprise. PC
an administration a residues, not being his dismissing doctor it a residues after these were already in a generate enterprise the loss can be:

- Boat scuff adze wagons flowed unobserved from his pipelines vessels;
- The used useless energy to the of a remaking excessive amounts of his steams warm water, necessary the technological his process of the needs of the enterprise;
- The used-up unadvisable waters in a the system of defecation overachiever;
- Rows materials, materials and produced finite or which semi finite depreciated pursuant using, manipulation, storage.

PC or the minimization of loss is achieved through the of a development the systematic program of missed bare the possible solutions of the exhibition the best one maul solution [4].

Because the project of PC comprises the determination and the of a pursuit big number of loss and which emissions comes from an important number of sources , the program of implementation is complex. He is due to enjoied the support of management ,except than how much commitment and as the support continuously. A good program prompts, also the how much implication the much maul peoples and the systematic gave the informations and the evaluation expenditures.

Therefore PC prompts:
- Employ the manager;
- The implication of the camera – mans;
- The onset organized.

The requirements for a team of PC are:
- Equip is able to identify the timeliness, to develop solutions and implement them;
- The size and his components is thus chooosed that to present functions different interests.

A successful program needs an which chiefs has the authority took in a decisions good organized programs, each person from firm gambles really a role in put in practices a solutions, identifying the loss and developing solutions for their minimization, the program becoming an usual activity the motivated popularly the wage earner enterprises[5].

Figure 1 is represented the strategy continue PC.

A program of PC difficult when is good organized, the tasks are rigorous delivered and followed. Specify as the minimization of the loss isn't equivalent to the auditing programs of pollution, such as the treatment of residual his waters of the removal of the residues [6].

**Fig. 1 The strategy of continue PC**

The clean production is achieved through three logical steps:

1. the inventory of the sources – waves are generated the residues and the emissions?
2. the evaluation of the causa – why are generated the residues and emissions?
3. the generation of the opinion – how can be eliminated these causes?

The evaluation of clean production is achieved the next in steps:

**Start Phase 1. Preparation**

1.1 Constitute equip PC
1.2 Print phases process
   - Is specified all the process, inclusively production handle and the material transport, utilities;
   - Heeded special the occasional operations(wash the ablution, etc)
   - Is identified – the most important – the entrances and come out: materials, energy, water, residues, emissions;

**1.3 Objectives selection for estimate PC.**
- Economic considerations – loss of money and composition of the fluxes of residues;
- Considerations of average – the volume and the composition of the fluxes of residues;
- Technical considerations – the potentials of improvement

**Analyses Phase 2. Analyse the phases of process**

1. preparation diagram flux
   - "material balance- sheet the power (on basis of binds the preservation of table: materials entered + materials produced = materials comed + spent materials);
   - Arrogation costs:
     - the produced intermediaries, operatic costs, costs of collection handle the
residues;
• External costs: taxes for evacuations;
• Penalty costs for settlement.
Analyse the causes which produce sweepings
• The impact of features produced;
• The impact of technical facors – process, equipments, mountings the equipments, pipelines, systems of monitorising;
• The impact of practices operatic – planning production, procedures operatic, programs of enterprise, instruct the personnel;
• The impact of handle, transports residues.

Phase 3. Generation timeliness PC
• Develop the timeliness PC
• the encouragement of the through innovative , solicit of ideation outwardy the team (the encouragement all ones employee participation of the enterprise).
• Examination of manual databases, pervious reports PC, bench markinr of technologist;
• Is verified all the preventive practices: modification of produced , the change of raw materials, the change of the technology , the modification of the equipments, the improvement check of the process, local recovery , good management, generation of useful products.
• Selection timeliness employable PC:
• the implementation of obvious feasible options;
• the rejection of insubstantial options.

The improvement Phase 4. Selection timeliness PC
The evaluation of remained options:
• the technical evaluation: the availability and the confidence equipment; requirements for upkeep; technical necessary capacity(camera-mans, technicians);
• the financial evaluation: investments(equipments, buildings, operate), costs and benefits operatic; economic calculi (miss of amortization);
• evaluation from the viewpoint of appearances of average: reduce the amount of pollutions; reduce the toxicity of pollutions; reduce the consumption of material, reduce the consumption of energy, reduce the solution of implantation combination of the results, technical evaluation, economic evaluation of average.

Phase 5. Implementation of PC solutions
• the preparation of the plan of the implementation;
• execution implement PC
• monitorizaring and evaluation results, comparison the results obtained with one preconisating

Integrate Phase 6. Support solutions PC
• the definiteness of organizational structure for PC;
• the implication of all employees through training and benefits;
• the elaboration of politics and the strategy long term PC;
• the integration PC in the technical development the integration of the concept of the resa
• earch of technological development, in curricula the schoolboy.

An important role a material to a these objective solution of PC constitute the bookkeeping for the management environment (environment management accounting= EMA).
EMA is can defined as : the identification , the collection , the estimation , the material use of the informations concerning the costs of average, and other informations of costs, incite for the taking of how much decisions of the average from the frame organizations.

2. Modern systems of used-up forecast for the administration residues
The system of flag and warning have a special case of the general informational systems and communicational system from a firm. Their role is those to delivered informations on strength of gived existences about an events and what evolutions can appear in the future, as for example the ecologic hollows for the sockage residues next in years. Of a such importance systems, follows when in the current activity of the firm appear negative events which effects are can counteracted through which measures taken the in temporally useful. Is can said as the systems of warming and forecast am which systems generates "for acts" and which I improve the performances of the managers through which I improve the performances of the managers through cognition and anticipation [7].
These systems of forecast some closed systems, which in nobody can't realize what is going on, on the contrary, they open systems, transparencies, waves are can see all the relations and the structural connections between the which elements underline the forecasts elaborate. Therefore, the systems of forecast don't help merely earlier warning about
what events can appear, they represent an instrument of proper thing, what which the engaged firms works the determination and the pursuit of the relations respective cause of the consequences of the activity and the decisions on which take them. Still from these implementation systems the users are accustomed to the intimation of structural relations of causal si among undertake and average her external and the internal. This is the kind and their shares shall become transparencies as apprehended the elements of average which influences the activity of the firm [8].

A system of forecast and warning can be described in a form simplify as follows:

![Diagram of causal relations in forecast systems]

Figure 2. The causal in a relations the systems of forecast simplified

Where : A = the shares of the firm;
O = objectives of firm;
I = external influences (the entrances in system) carry affects the objective suggested touch;
h1,h2 = the components of the bearers of decision against the act
O1,O2 = the causal connections objective of dependency with the variables.

This famous model show the relation between the measures taked in as part as the firm (the suggested objective the external influences) I carry he affects the objective suggested touch. The decisions and the measures, carry I taken the in as part as the firm, depend so the influences of the factors from average external knowed at one time, but and of the degree of achieve objective in the respective moment [9].

In special literature they defined three stages in the evolution of the systems of forecasts:

1. **First generation of systems of forecast.**
   
   This scream of were conceived in the America between the years '60, they appeared the fore rank in as the systems of report, carry evolved to the intimation of the anomalies, what appeared in the natural scroll of the series of historic date income from the current activity of firm. Already between the years '70 can speak of systems of warning, based on adding technique funded out in the beginning, but in a quick development the contiguous these systems became valuable instruments in the activity of planning and check, they deflect signals of indicators against the boundaries of tolerance admitted. They else are used today in as part as the budgetary forecasts from the course of the year waves is caused the abbots between the plans and approved budgets initially , abbots appeared against these and their effects about the ultimate results. The estimation were possible real values holds on to the systems of forecast.

2. **The second generation of systems of forecast don't preoccupied maul of movements signalization real values in the frame interval of tolerance, but they passed to the elaboration systems of indicator aggregates his wagons surprised village the many maul informations about the future evolution of the machines of reference. This thing happened last the years '70. Against the systems from first guarantee, these is characterized through the systematic search of the factors, of the elements and the relevant evolutions incite as the external as the internal average in.

3. **The third generation of systems of forecast bared potentially, generator of advantages for enterprises, through the intimation and the such exploitation thin studious signs of the economist Igor Ausoff.** The quality of dependent decisions in big measures of the quality of which informations underlie they. Frequently, only that, happened as his decisions isn't taked on rational bases but on intuitive bases. With all these most the decisions need informations about the evolution of which factors influences the activity of the firm therefore need forecasts referring to these.

For each specific case exist differently methods of which forecast wines in the welcome needs informational specify. In the case of the strategies is need of long term forecasts without a very exact expatiation, for instance, to elaborate of strategic long term plans is organized meetings of management reams with his without expert and external consultants. To these is achieved the future scenarios with of a help methods of qualitative nature such as: brain storming or method Delphi, but discussed and probabilities or appearance of
differents scenarios. Thus of scenarios concerning forecast of the administration of residues burn be:

- Historic – which in the evolution of relevant factors remains identically with one historians.
- Average – which in the evolution of relevant factors is calculating as the their media.
- Optimistic – which in proposes a positive evolution of relevant factors(trend) for instance, in the case of the evolution of population taking into consideration that has trend a negative historian, can proposed 0 coefficient-stagnation of population.

Marvel of relevant factors concerning the scenarios:

Table 1 : The historic evolution of relevant factors for systems in period 1999 – 2003.

<table>
<thead>
<tr>
<th>Hypotesis</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>715.228</td>
<td>717.224</td>
<td>719.134</td>
<td>707.242</td>
<td>705.555</td>
</tr>
<tr>
<td>The area of covering with salubrity services</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>25.2</td>
<td>2%</td>
</tr>
<tr>
<td>The economic evolution with effects about</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Amounts of residues housekeepers(tons)</td>
<td>56.6 34</td>
<td>78.6 25</td>
<td>88.3 46</td>
<td>103.485</td>
<td>75.9 56</td>
</tr>
<tr>
<td>Amounts of assimilable residues municipal coming from the economic sector(tons)</td>
<td>28.5 42</td>
<td>26.3 74</td>
<td>26.2 86</td>
<td>25.1 17</td>
<td>22.8</td>
</tr>
</tbody>
</table>

Table 2 : The evolution of relevant factors for systems for three one scenarios:

<table>
<thead>
<tr>
<th>Scenario Hypotesis</th>
<th>Istorical</th>
<th>Pessimist</th>
<th>Optimist</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Population</td>
<td>-0.34 %</td>
<td>-1 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Areas of what covering jobs of salubrity</td>
<td>10 %</td>
<td>9 %</td>
<td>13 %</td>
</tr>
</tbody>
</table>

In abaft evaluation and politics of factors influences the administration residues, most important factors were identified as follows:

1. the demographic development – the evolution of population
2. the economic development – except in what looks the development of industry and economic sector as well as the evolution comed the population;
3. the area of covering with jobs of salubrity;
4. the amount of residues collected from population and from firms;
5. the amount of residues from gardens, markets and street residues;
6. the amount from the stations of defecation, the amount of residues from buildings and demolitions;
7. the degree of educate of the population – inclusively through legislative measures.

As any chronological seasonal serie, forecast of relevant factors can be haggard on three one components:

1. trend – what I show general tendency of evolution on an elder period of time (the many years);
2. seasonal component evidenced of the oscillations demonstrated on of a period of a year;
3. residual component which is a pure aleatory process, after the model

\[ Y_t = f(t) + s(t) + \epsilon_t \]

or

\[ Y_t = f(t) \ast s(t) \ast \epsilon_t \]

where:

- \( Y_t \) = the real values of the phenomenon;
- \( f(t) \) = trend, output the act of elemental factors;
- \( s(t) \) = seasonal component, result of the
act of seasonal factors;
ε = residual component, result of the act of accidental factors.

Emphasized influence of each one component in the evolution of the phenomenon is utilized method of variation. As per this methods, the variation total the phenomenon is shall decomposed the variation below influential the elemental factors, the variation below influential the seasonal factors of the variation determinates of aleatory factors:
\[ 
\sum_i \sum_j (y_{ij} - \bar{y}_0)^2 = \sum_i (y_i - \bar{y}_0)^2 + \sum_j (y_j - \bar{y}_0)^2 + \sum_i \sum_j (y_{ij} - \bar{y}_i - \bar{y}_j + \bar{y}_0)^2 
\]

The total variation the explained the explained variation of Variation of variation of seasonal aleatory component Trend component component where:
y_{ij} = the values registered of the variable “i” studious in the year “i”, waves i=1,5 (1999 – 2003) and in mouth “ j”, waves j=1,12
\bar{y}_i = the annual average of studious variable;
\bar{y}_j = the monthly average of studious variable;
\bar{y}_0 = the general average of studious variable.

3 Conclusion
Clean production is most commonly addressed through the implementation of Environmental Management Systems (EMS) and is focused on the environmental impacts associated with how we make things. It represents environmentally responsible manufacturing practices. Rigorous environmental management systems seek to reduce and ultimately eliminate the environmental impact of any emissions and toxins associated with production processes. For packaging, this means that sustainability is defined not only by the package, but also how that package or product is made. Countries with well-developed environmental policies use regulatory programs to require companies to comply with emission limits and to control the release of hazardous wastes. More recently, market-based cap and trade systems have been implemented as a regulatory strategy.

References
[1] Brecht, Bennett C., Aiken, J. A lot of Nerve, Keyboard magazine, June 2005
This paper explores the implementation of lean, with a particular focus on the choice of lean tools that are relevant to specific situations. We apply a risk management perspective, in the sense that the implementation of lean can be an opportunity for the organisation (if implementation succeeds) or a threat (failed implementation and wasted organisational effort, and resistance against future attempts). Thus we explore the intersection between strategic risk management and lean implementation. Lean is a strategy developed for production improvement. It originated in the mass production setting of the automobile industry, specifically the Toyota Production System. The introduction and implementation of Lean Production Principles over the last twenty years has had a notable impact on many manufacturing enterprises. The practice shows that lean production methods and instruments are not equally applicable to large and small companies. After the implementation in large enterprises belonging to the automotive sector the concept of lean thinking was introduced successfully in medium sized enterprises. Small enterprises have been ignored for a long time and special investigations about this topic are rarely. Considering statistical data and analysis about the Introduction to cleaner production (cp) concepts and practice. Prepared by the Institute of Environmental Engineering (APINI) Kaunas University of. Technology, Lithuania. Objective: to contribute to sustainable business development in the glass region of Marinha Grande, through the implementation of cleaner production strategies in companies. Funding: POE/FSE. Duration: 15 months.