

Reliability and maintenance

experience history



RCM Methodology applied to a bottling line

In the plant of San Pellegrino/ Nestlé Acqua Vera di San Giorgio in Bosco (PD), one of the parameters related with the company management is the efficiency of the production lines, so the reference indicator is always the “production performance”.

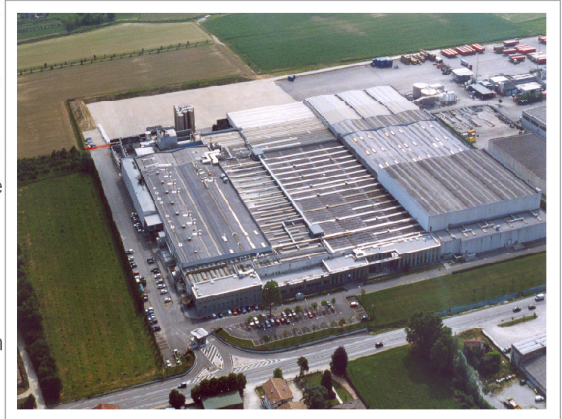
The factors that influence this KPI are various and strictly correlated among them. Therefore, Acqua Vera is in accordance with the company policies.

In 2007, a new continuous improvement program of TPM and RCM Analysis is started.

Applying RCM in Acqua Vera requires a philosophy based on a Programmed Maintenance Plan on a machine which becomes the output of a quantitative analysis made on certain data.

How to apply RCM?

Inspiring Consulting has proposed Acqua Vera a logical process based on RCM and constituted of the following phases:



1. Selection of the critical machines subject to the analysis with an environmental and organizational context Justifying the needs of implementing a methodological and exhaustive analysis such as RCM.
2. Functional decomposition of the machine
3. FMECA on failure modes
4. Selection of critical functional groups and components via an analysis of Pareto
5. Documentation of the action plan for attenuation and elimination of criticality
6. Selection of the best Maintenance Policy (corrective or programmed and inspective) to execute on components critical resource constraints (budget and man/hour)
7. Implementation of selected maintenance policy
8. Monitoring of the policy results with the data obtained from the field and adjustment of the maintenance policy targeting the optimum (ex: increase in the availability of time intervals considered)

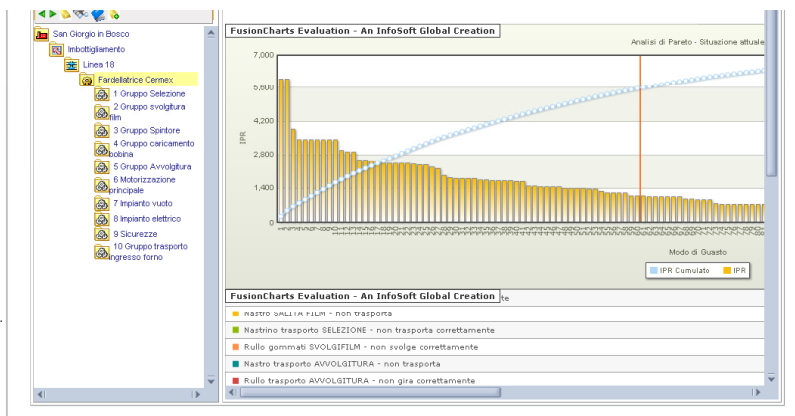
How to implement RCM?

In order to implement this process, the support of a special IT tool is essential. Thus, the company has acquired the ad-hoc solution of Inspiring Software for the Maintenance Engineering, the module of Reliability and Engineering of **OTM**, that helps implement the structured analysis process in the following phases when the critical machine or the line is once selected:

- a. Functional decomposition of the machine: it is a functional decomposition tree (of the *shrink wrapper* in this case). The followed logic in the decomposition identifies all those groups that have a function independently from their physical position in the machine;

the beginning with that of the current in the module of Pareto;

- e. Economical analysis of the modes or critical components: **OTM** handles assessing the economical benefit of the work by proposing a mix of optimum and feasible maintenance policies which take into account the constraints of the system. The module of Economical Analysis becomes a useful tool to construct a budget of maintenance weighted on "risk" (production loss) generated by the inconvenience of the failure;



- f. A proposal of a Maintenance Plan to execute on the most critical components of the machine that keeps track of the technical and economics aspects. The software helps select not only 10 best maintenance policies, but also it does it among all the possible combinations. This is the phase that allows considering and assessing as well as viewing the possible maintenance policies which is called "Tuning". The objective and power of this step is to select, view and compare a policy with the absolute optimum solution and with another feasible policy. It is noteworthy here to note that it is not always the best policy to choose the one with the minimum costs. There could be higher risks involved in it. All depends on the type of the failure and the harm given by the failure.

CONCLUSION

In the light of these being said, it is evident how the utilized instrument helped the company pass to a systematic and methodological approach in having a more detailed level of knowledge on the machine and the possibility of sharing the criticality with the maintenance team involved by proposing a basis for the Maintenance Engineering. It is achieved not only to satisfy the needs of the "production client", but also above all, for its own efficiency, either as a budget forming instrument or a control and improvement/optimization instrument of the maintenance resources, which could have been wasted in any other way. For this purpose, the objective of Acqua Vera will be to extend the analysis to other critical machines for the next months and diffuse this winning approach not only to maintenance operators but also to production and quality managers.



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